

**FINAL
ENVIRONMENTAL ASSESSMENT
FOR
CONSTRUCTION OF SMALL ARMS RANGE
AT
TINKER AIR FORCE BASE**



Prepared for:

**Air Force Material Command
Tinker Air Force Base, Oklahoma**

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**FINDING OF NO SIGNIFICANT IMPACT
ENVIRONMENTAL ASSESSMENT
CONSTRUCTION OF SMALL ARMS RANGE
TINKER AIR FORCE BASE, OKLAHOMA**

AGENCY: 72nd Air Base Wing (ABW) Tinker Air Force Base (TAFB) Oklahoma.

INTRODUCTION: TAFB proposes to demolish the existing Small Arms Range and construct a new fully-contained range to enable personnel stationed at TAFB to obtain mandatory weapons training.

The National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190) requires all federal agencies to address the environmental impacts of any federal action in the natural and human environment. This Environmental Assessment (EA) was prepared to comply with requirements set forth in NEPA, as implemented by Title 40 of the Code of Federal Regulations (CFR) Parts 1500 through 1508, by the U.S. Air Force (USAF) implementing regulations 32 CFR 989, Environmental Impact Analysis Process, and by the USAF EIAP Desk Reference, May 1995.

PROPOSED ACTION: The proposed action is to demolish the existing range, and construct a fully-contained 25 meter small arms range with an associated Combat Arms Training and Maintenance (CATM) section in accordance with Engineering Technical Letter (ETL) 08-11, AFH 32-1084 and other government specifications that apply to firing ranges. Buildings 1023, 1024, and 1025 will be demolished, and lead contamination from the existing range will be remediated or reclaimed if possible. The proposed site for the new range is south/southwest of Building 1025, with a parking lot constructed in the area of Building 1024, with an entrance at the east end of the current Building 1025. Building 1050 will be retained as a classroom and office space for the new Small Arms Range.

SUMMARY OF FINDINGS FOR PROPOSED ACTION:

Land Use. A long-term positive impact will result from the remediation of lead contamination and the demolition of the existing range (Building 1024), and the remediation and demolition of Building 1025, which is no longer in use.

Air Quality. No new permanent emission sources are expected to be created as a result of the Proposed Action. Using EPA AP-42 emission factors to calculate the estimated emissions from the type/amount of lead rounds estimated to be fired annually, the amount of lead emissions is minimal. Based on the anticipated use, the proposed range would be classified as an insignificant air emission source and would not require permitting action. A short term increase in air emissions would be associated with the construction and demolition activities.

Water Resources. No adverse effect to water resources would occur as a result of the proposed action. Best management practices would be implemented during demolition and construction activities to avoid potential for short-term soil erosion which could result in adverse effects to water quality.

Hazardous Materials and Waste. Soil from the remediation activities could potentially be characterized as hazardous waste and require disposal at a hazardous waste landfill. Further assessment would be required before remediation commenced. Frangible rounds are now fired at the existing range and are anticipated to be fired at the new range, but the amount of hazardous waste generated by the new range could increase if lead rounds are used.

No long-term adverse effects from the Proposed Action were found to be associated with Geological Resources, Biological Resources, Cultural Resources, Socioeconomics or Environmental Justice.


ALTERNATIVE ACTION: No viable alternative locations for the Small Arms Range have been located at TAFB.

SUMMARY OF FINDINGS FOR NO-ACTION ALTERNATIVE: The conditions and characteristics anticipated under the No-Action Alternative for each resource area will continue at levels equal to those occurring under the existing condition. Therefore, no significant impacts will be expected for the No-Action Alternative. However, the continued use of this existing facility results in a failure to meet all mandatory weapons training.

SUMMARY OF CUMULATIVE IMPACTS: The cumulative impact of implementing this action along with other past, present, and future projects were assessed in the attached EA, and no significant cumulative impacts were identified.

SUMMARY OF PUBLIC COMMENTS: Summary of public comments will be inserted for final document upon completion of the public review period.

FINDING OF NO SIGNIFICANT IMPACT: After careful review of the potential impacts of this Proposed Action, I have concluded that the action's implementation would not have a significant impact on the quality of human or natural environment or generate significant controversy. Accordingly, the requirements of NEPA and CEQ regulations and 32 CFR 989, et seq. have been fulfilled, and an Environmental Impact Statement (EIS) is not necessary and will not be prepared.



ALLEN J. JAMERSON
Colonel, USAF
Commander, 72nd Air Base Wing

8 Dec 08

Date

**FINDING OF NO SIGNIFICANT IMPACT
ENVIRONMENTAL ASSESSMENT
CONSTRUCTION OF SMALL ARMS RANGE
TINKER AIR FORCE BASE, OKLAHOMA**

AGENCY: 72nd Air Base Wing (ABW) Tinker Air Force Base (TAFB) Oklahoma.

INTRODUCTION: TAFB proposes to demolish the existing Small Arms Range and construct a new fully-contained range to enable personnel stationed at TAFB to obtain mandatory weapons training.

The National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190) requires all federal agencies to address the environmental impacts of any federal action in the natural and human environment. This Environmental Assessment (EA) was prepared to comply with requirements set forth in NEPA, as implemented by Title 40 of the Code of Federal Regulations (CFR) Parts 1500 through 1508, by the U.S. Air Force (USAF) implementing regulations 32 CFR 989, Environmental Impact Analysis Process, and by the USAF EIAP Desk Reference, May 1995.

PROPOSED ACTION: The proposed action is to demolish the existing range, and construct a fully-contained 25 meter small arms range with an associated Combat Arms Training and Maintenance (CATM) section in accordance with Engineering Technical Letter (ETL) 08-11, AFH 32-1084 and other government specifications that apply to firing ranges. Buildings 1023, 1024, and 1025 will be demolished, and lead contamination from the existing range will be remediated or reclaimed if possible. The proposed site for the new range is south/southwest of Building 1025, with a parking lot constructed in the area of Building 1024, with an entrance at the east end of the current Building 1025. Building 1050 will be retained as a classroom and office space for the new Small Arms Range.

SUMMARY OF FINDINGS FOR PROPOSED ACTION:

Land Use. A long-term positive impact will result from the remediation of lead contamination and the demolition of the existing range (Building 1024), and the remediation and demolition of Building 1025, which is no longer in use.

Air Quality. No new permanent emission sources are expected to be created as a result of the Proposed Action. Using EPA AP-42 emission factors to calculate the estimated emissions from the type/amount of lead rounds estimated to be fired annually, the amount of lead emissions is minimal. Based on the anticipated use, the proposed range would be classified as an insignificant air emission source and would not require permitting action. A short term increase in air emissions would be associated with the construction and demolition activities.

Water Resources. No adverse effect to water resources would occur as a result of the proposed action. Best management practices would be implemented during demolition and construction activities to avoid potential for short-term soil erosion which could result in adverse effects to water quality.

Hazardous Materials and Waste. Soil from the remediation activities could potentially be characterized as hazardous waste and require disposal at a hazardous waste landfill. Further assessment would be required before remediation commenced. Frangible rounds are now fired at the existing range and are anticipated to be fired at the new range, but the amount of hazardous waste generated by the new range could increase if lead rounds are used.

No long-term adverse effects from the Proposed Action were found to be associated with Geological Resources, Biological Resources, Cultural Resources, Socioeconomics or Environmental Justice.

ALTERNATIVE ACTION: No viable alternative locations for the Small Arms Range have been located at TAFB.

SUMMARY OF FINDINGS FOR NO-ACTION ALTERNATIVE: The conditions and characteristics anticipated under the No-Action Alternative for each resource area will continue at levels equal to those occurring under the existing condition. Therefore, no significant impacts will be expected for the No-Action Alternative. However, the continued use of this existing facility results in a failure to meet all mandatory weapons training.

SUMMARY OF CUMULATIVE IMPACTS: The cumulative impact of implementing this action along with other past, present, and future projects were assessed in the attached EA, and no significant cumulative impacts were identified.

SUMMARY OF PUBLIC COMMENTS: Summary of public comments will be inserted for final document upon completion of the public review period.

FINDING OF NO SIGNIFICANT IMPACT: After careful review of the potential impacts of this Proposed Action, I have concluded that the action's implementation would not have a significant impact on the quality of human or natural environment or generate significant controversy. Accordingly, the requirements of NEPA and CEQ regulations and 32 CFR 989, et seq. have been fulfilled, and an Environmental Impact Statement (EIS) is not necessary and will not be prepared.

ALLEN J. JAMERSON
Colonel, USAF
Commander, 72nd Air Base Wing

Date

Executive Summary

Tinker Air Force Base (TAFB) proposes to construct a new Small Arms Range. The existing Small Arms Range, which is deteriorated due to age and soil erosion, too small for heavy weapons training, and therefore inadequate for its current mission of providing training and certification for handguns, shotguns, rifles, and machine guns up to 7.62 millimeter, will be demolished.

The new Small Arms Range will consist of a fully-contained 25-meter, 28-position range with a target retrieval system. An associated Combat Arms Training and Maintenance facility will also be constructed and will provide administrative space, a weapons simulator room, weapons/ammunition storage, restrooms, and an additional storage area. The ventilation system will control lead exposures to instructors and trainees in accordance with Occupational Safety and Health Act requirements.

The proposed location for the new Small Arms Range is on the same site as the existing Small Arms Range. Three (3) buildings will be demolished, i.e., Buildings 1023, 1024, and 1025. Building 1050 will be retained as a classroom and office space for the new Small Arms Range.

This EA has been prepared in accordance with the National Environmental Policy Act to identify potential effects of the proposed action associated with the proposed demolition of the existing Small Arms Range and construction of a new, state-of-the-art, fully-contained Small Arms Range.

Under the No-Action Alternative, no construction of a new Small Arms Range would occur at TAFB. The existing range has deteriorated due to age and erosion. Also, the existing range does not have the capability to provide training for military personnel requiring certification for belted automatic weapons, i.e., machine guns. Therefore, continued use of the existing facility would not allow TAFB personnel to meet all necessary, mandated weapons training.

The anticipated impacts associated with the proposed action are presented in Table 2-1. These include:

- Short term impacts from dust emissions from construction
- Potential soil erosion and short-term storm water impacts from construction
- Potential for lead-contaminated soils to meet the definition of hazardous waste, requiring management per United States Environmental Protection Agency requirements
- Structures to be demolished may contain asbestos containing material (ACM)
- Construction debris may contain lead based paint
- Temporary impacts from noise associated with construction
- Interior noise impacts are anticipated, due to the fully-contained facility

The proposed mitigation actions for these anticipated impacts are summarized in Table 2-2.

Mitigation actions include:

- Minimize dust emissions from construction by watering exposed soils, soil stockpiling, and soil stabilization
- Minimize soil erosion and storm water impacts through compliance with Oklahoma's General Permit for storm water discharges associated with construction activities, and best management practices
- Characterize site soils and, if hazardous, remove and dispose of soils at an EPA-approved landfill
- Inspect structures to be demolished for ACM
- Dispose of demolition debris as solid waste at a local landfill
- Minimize interior noise impacts through operating procedures that require proper hearing protection

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Acronyms and Abbreviations

ACM	Asbestos-Containing Materials
AFCESA	Air Force Civil Engineering Support Agency
AFI	Air Force Instruction
AICUZ	Air Installation Compatibility Use Zone
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CATM	Combat Arms Training and Maintenance
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CWA	Clean Water Act
DEQ	Oklahoma Department of Environmental Quality
DoD	Department of Defense
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EO	Executive Order
EPA	United States Environmental Protection Agency
ETL	Engineering Technical Letter
FCF	Fuel Control Facility
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
FY	Feasibility Study
HAP	Hazardous Air Pollutant
HAZMAT	Hazardous Materials
HMMP	Hazardous Materials Management Program
HWSF	Hazardous Waste Storage Facility
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
IWTP	Industrial Wastewater Treatment Plant

LBP	Lead Based Paint
LSZ	Lower Saturated Zone
LLSZ	Lower Lower Saturated Zone
NAAQS	National Ambient Air Quality Standard
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO ₂	Nitrogen Dioxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resourced Conservation Service
OSHA	Oklahoma Water Resources Board
PA	Preliminary Assessment
PM _{2.5}	Particulate Matter 2.5 microns in diameter and smaller
PM ₁₀	Particulate Matter, larger than 2.5 and smaller than 10 microns in diameter
ppm	Part per million
PZ	Production Zone
RCRA	Resource Conservation and Recovery Act
SDZ	Surface Danger Zone
SIP	State Implementation Plan
SO _x	Sulfur Oxides
SO ₂	Sulfur Dioxide
TAFB	Tinker Air Force Base
TCLP	Toxicity Characteristic Leaching Procedure
USACE	United State Army Corps of Engineers
USAF	United States Air Force
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USZ	Upper Saturated Zone
VDZ	Vertical Danger Zone

1.0 PURPOSE AND NEED FOR PROPOSED ACTION

1.1 PURPOSE AND NEED FOR PROPOSED ACTION

The National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190) requires all federal agencies to address the environmental impacts of any federal action in the natural and human environment. This Environmental Assessment (EA) is being prepared to comply with requirements set forth in NEPA, as implemented by Title 40 of the Code of Federal Regulations (CFR) Parts 1500 through 1508, by the U.S. Air Force (USAF) implementing regulations 32 CFR 989, Environmental Impact Analysis Process (EIAP), and by the USAF EIAP Desk Reference, May 1995.

This EA has been prepared in accordance with NEPA to identify potential effects of the proposed action and alternative actions associated with the proposed demolition of components of the existing Small Arms Range at Tinker Air Force Base (TAFB), and the construction of a fully-contained 25 meter Small Arms Range with 28 firing positions.

1.2 PURPOSE OF PROPOSED ACTION

The proposed action is to demolish the existing range, and construct a fully-contained 25 meter Small Arms Range with an associated Combat Arms Training and Maintenance (CATM) section in accordance with Engineering Technical Letter (ETL) 08-11, AFH 32-1084 and other government specifications that apply to firing ranges. Buildings 1023, 1024, and 1025 will be demolished, and lead contamination from the existing range will be remediated or reclaimed if possible. The proposed site for the new range is south/southwest of Building 1025, with a parking lot constructed in the area of Building 1024 and the range entrance located at the east end of current Building 1025. Building 1050 currently provides classroom and office space for the Small Arms Range, and will remain in operation, providing classroom and office space for the new Small Arms Range. Remediation of lead-contaminated soil and demolition of existing structures will occur before new construction of the new facility begins.

The new Small Arms Range will enable personnel stationed at TAFB, as well as TAFB personnel being deployed to other areas, to obtain mandatory weapons training. The weapons training to be conducted at the new Small Arms Range will include certification courses for handguns, shotguns, rifles, and machine guns up to 7.62 millimeter.

1.3 NEED FOR PROPOSED ACTION

Construction of the proposed Small Arms Range is critical if TAFB is to provide adequate training for military personnel requiring certification in handguns, rifles, shotguns, and machine guns. The existing range does not meet current ETL standards, i.e., ETL 08-11; therefore, training and certification as implemented in USAF Policy Directive 36-22, *Air Force Military Training* and Air Force

Instruction (AFI) 36-2226, *Combat Arms Program* cannot be conducted. The existing Small Arms Range is over 20 years old, can be used only in fair weather, and has severe erosion problems around Building 1024. Building 1024 has been shut down to lead rounds due to surface danger zone and vertical danger zone violations, and is open only to frangible rounds. (See Section 2.2 for discussion of surface and vertical danger zones.) Building 1024 is not adequately enclosed and, therefore, weather conditions adversely affect the operations. Building 1025, the rifle range, has been shut down and is no longer used due to surface danger zone and vertical danger zone violations. The existing range does not have the capability to provide training for military personnel requiring certification for belted automatic weapons, i.e., machine guns. The continued use of the existing range would result in a failure to meet all mandatory weapons training. The new, fully-contained range would be built to meet current ETL standards and will provide adequate training capabilities while minimizing lead exposures to acceptable levels.

1.4 LOCATION OF THE PROPOSED ACTION

The proposed action would occur on TAFB. TAFB is located in Oklahoma County, approximately 5 miles southeast of downtown Oklahoma City, Oklahoma (**Figure 1-1**). The main portion of TAFB is located within the incorporated city limits of Oklahoma City, Oklahoma. TAFB is bordered to the north by Interstate 40 and Southeast 29th Street, to the east by Douglas Boulevard, to the south by Southeast 74th Street, and to the west by Sooner Road. Incorporated areas immediately surrounding the installation include Midwest City to the north, and Del City to the northwest (**Figure 1-2**). The existing Small Arms Range is located approximately one half mile east of Air Depot Boulevard, on the south side of Reserve Road, opposite the parking lot of Building 1083 located on the north side of Reserve Road.

1.5 DECISION TO BE MADE

This EA evaluates the potential environmental consequences associated with the demolition of components of the existing range and the construction of a new Small Arms Range. Based on this information, the USAF will determine if the proposed action qualifies for a Finding of No Significant Impact (FONSI) or will require the preparation of an Environmental Impact Statement. As required by NEPA and its implementing regulations, preparations of an environmental document must precede final decisions regarding the proposed project, and be available to inform decision makers of the potential environmental impacts.

1.6 SCOPE OF THE ENVIRONMENTAL REVIEW

NEPA, as amended, requires federal agencies to consider potential environmental consequences of proposed actions. The law's intent is to protect, restore, or enhance the environment through well-informed Federal decisions. The President's Council on Environmental Quality (CEQ) was

established under NEPA for the purpose of implementing and overseeing Federal policies as they relate to this process. The USAF EIAP is accomplished through adherence to the procedures set forth in CEQ regulations (40 Code of Federal Regulations [CFR] Sections 1500-1508 and 32 CFR 989, 15 July 1999, and amended 28 March 2001). These federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation designed to ensure that deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action.

This EA identifies, describes, and evaluates the potential environmental impacts that are associated with the demolition of components of the existing Small Arms Range, and construction of a new, fully-contained Small Arms Range. The potential environmental effects of taking no action (i.e., the No-Action Alternative) are also described. As appropriate, the affected environment and environmental consequences of the action may be described in terms of a regional overview or a site-specific description. Fiscal year (FY) 2007 or the most current information available is used as the baseline condition.

1.6.1 Resource Areas Addressed in the EA

Resource areas that could be affected by the proposed action have been selected to allow for a comprehensive analysis of potential impacts. The following resource areas are discussed in the EA:

- Air Quality
- Water Resources
- Hazardous Materials and Hazardous Waste
- Contaminated Soil
- Asbestos and Lead Based Paint Issues
- Biological Resources
- Cultural Resources
- Geology
- Noise

1.6.2 Regulatory Requirements Addressed in the EA

- Engineering Technical Letter 08-11
- 29 CFR 1910.1025, *Lead*
- Clean Air Act (CAA) (42 United States Code [USC] 7401 et seq.)
- AFI 32-7040, Air Quality Compliance
- EO 11990, *Protection of Wetlands*
- Clean Water Act (CWA) (33 USC 1251 et seq.)
- EO 11988, *Floodplain Management*

- Pollution Prevention Act of 1990 (42 USC 13101 and 13102 et seq.)
- Resource Conservation and Recovery Act (RCRA) (42 USC 6901 et seq.)
- Endangered Species Act (ESA) (16 USC 1531-1542 Archeological Resources Protection Act
- Native American Graves Protection and Repatriation Act of 1991 (25 USC 3001 et seq.)
- Energy Independence and Security Act of 2007 (Public Law 110-140)
- UFC 3-210-10, Low Impact Development
- EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*
- EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*

1.6.3 Issues Not Carried Forward for Detailed Analyses

Environmental Justice. Executive Order (EO) 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations,” requires federal agencies to identify community issues of concern during the NEPA process, particularly those issues relating to decisions that may have an impact on low-income or minority populations. The construction and demolition activities associated with the Proposed Action would not affect any low-income or minority populations.

Protection of Children. EO 13045, “Protection of Children from Environmental Health and Safety Risks,” mandates that all federal agencies assign a high priority to addressing health and safety risks to children. The EO also requires that federal agencies coordinate research priorities on children’s health and ensure that their standards take into account special risks to children. Construction and demolition activities associated with the proposed project would not expose children to elevated health and safety risk, as the proposed locations are not near residential areas or utilized for recreation. Therefore, no impacts associated with protection of children are anticipated.

Socioeconomic Impacts. The proposed demolition of the existing range and construction of a new Small Arms Range would have little if any long term impact on the local economy. Expenditures during the demolition and construction activities would result in a positive short-term impact to the local economy, but no new permanent positions are anticipated to be created at the new Small Arms Range.

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

TAFB has determined that the construction of a new Small Arms Range is necessary to enable personnel stationed at TAFB, as well as TAFB personnel being deployed to other areas, to obtain mandatory weapons training. The USAF defines a "Small Arms Range" as a live-fire training facility for training and certifying personnel in the use of handguns, shotguns, rifles up to 7.62 millimeter, rifles or machine guns up to .50 caliber, and the MK-19 40 millimeter machine gun. The weapons training to be conducted at the new TAFB Small Arms Range will include certification only for handguns, shotguns, rifles, and machine guns up to 7.62 millimeter.

The existing Small Arms Range is over 20 years old, can be used only in fair weather, and has severe erosion problems around Building 1024. Building 1024 has been shut down to lead rounds due to surface danger zone and vertical danger zone violations, and is open only to frangible rounds. Building 1024 is not adequately enclosed and, therefore, weather conditions adversely affect the operations. Building 1025, the rifle range, has been shut down and is no longer used due to surface danger zone and vertical danger zone violations. The existing range does not have the capability to provide training for military personnel requiring certification for belted automatic weapons, i.e., machine guns. Personnel requiring machine gun certification are currently traveling to the Army National Guard training base at Camp Gruber for training and certification. Camp Gruber is located approximately 150 miles east of TAFB, and the round trip travel time is approximately 5 hours.

2.2 PROPOSED ACTION

The Proposed Action (Project Number WWYK043022) is to demolish components of the existing range, remediate lead contamination as required, and construct a new Small Arms Range in the same area. The existing Small Arms Range is located approximately one half mile east of Air Depot Boulevard, on the south side of Reserve Road, opposite the parking lot of Building 1083 located on the north side of Reserve Road. The new fully-contained Small Arms Range, with an associated CATM section, is scheduled to be constructed in fiscal year 2012 in accordance with ETL 08-11, AFH 32-1084, and other government specifications applicable to firing ranges.

The Surface Danger Zone (SDZ) and Vertical Danger Zone (VDZ) associated with a fully-contained Small Arms Range (as defined in ETL 08-11) are reduced from those associated with non-enclosed ranges. For example, the SDZ (portions of the range in the horizontal plane that are endangered by firing a particular weapon) is reduced by building a fully-contained range incapable of allowing a fired projectile to escape its limits. A fully-contained range does not have an exterior SDZ, but does have an interior SDZ within the limits of the horizontal containment. The VDZ (volume of airspace above the SDZ between the ground surface and the maximum ordinate of a direct-fired or ricochet round) is

reduced in a fully-contained range by limiting the VDZ to the area between the SDZ and the upper limits of the containment. Therefore, a fully-contained Small Arms Range can be constructed in a much smaller area than a non-enclosed range.

The weapons/ammunition storage part of the CATM must be alarmed and meet the security requirements of AFI 31-209, as storage of explosives must comply with AFMAN 31-209. Buildings 1023, 1024, and 1025 will be demolished to make room for the new facility, and all lead contamination associated with the existing Small Arms Range will be remediated. Building 1050 currently provides classroom and office space for the Small Arms Range, and will remain in operation, providing classroom and office space for the new Small Arms Range. Some parking for the new facility will be available on the south side of Reserve Road in the area of Building 1050. Additional parking for large training groups will likely be available in the southeast end of the large parking lot of Building 1083, located on the north side of Reserve Road.

The new Small Arms Range will allow adequate training for military personnel requiring certification for handguns, shotguns, rifles, and machine guns. The facility will consist of a 25-meter, 28-position range with a target retrieval system. The CATM facility will provide administrative space, a weapons simulator room, weapons/ammunition storage, restrooms, and an additional storage area. The new facility will give TAFB training and live firing capabilities, twenty-four hours a day, seven days a week, for all qualification courses currently being taught. Complete enclosure of the range will reduce noise to base housing and to other areas of the base. Complete enclosure will also eliminate all adverse weather conditions such as heat, cold, ice, snow, and wind, which greatly affect the operation of the current range. Enclosure of the range will allow the addition of a proper ventilation system, which will prevent instructors and personnel being trained from breathing lead dust. The ventilation system will control lead exposure in accordance with 29 CFR 1910.1025 - *Lead*. The supply and exhaust ventilation system is critical to the safe operation of a fully-contained indoor range and to the health of those who work or train in the range.

The new range will be constructed to accommodate training regimens that require the shooter to move laterally across the firing line, as well as move downrange to engage targets. The new facility will be available to other end-users on an "as available" basis; however, the scope of the project is based on USAF requirements.

2.3 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, no construction of a new Small Arms Range would occur at TAFB. Use of the existing Building 1024 for small arms training could continue, but the continued use of the

existing facility would not allow TAFB personnel to meet all necessary, mandated weapons training, and would not address the safety and environmental concerns associated with the existing facility.

Although the No-Action Alternative would not fulfill the purpose and need of the Proposed Action, the No-Action Alternative will be carried forward as required by the CEQ. CEQ's regulations for the implementation of NEPA stipulate this alternative must be considered to assess environmental impacts that may occur if the Proposed Action is not implemented.

2.4 ALTERNATIVES ELIMINATED FROM CONSIDERATION AND NOT CARRIED FORWARD

TAFB Civil Engineering performed an exhaustive evaluation of all undeveloped areas on TAFB in an attempt to identify additional alternative sites for consideration as potential locations of the new Small Arms Range. However, all undeveloped areas of adequate size for a Small Arms Range are already designated for other improvements, and cannot be feasibly considered as alternative sites for the new Small Arms Range.

Another alternative briefly considered is upgrading or improving the existing Small Arms Range facilities to meet the current ETL standards. However, TAFB Civil Engineering determined that this alternative is not at all feasible, due to the degree of deterioration of the existing buildings.

Another alternative site for the new Small Arms Range is the nearby inactive General Motors Facility. Oklahoma County acquired the former General Motors facility when voters approved a \$55 million bond issue on May 13, 2008. TAFB is acquiring this property through a long-term lease agreement with Oklahoma County. This 407-acre parcel of land with 3.8 million square feet of industrial, manufacturing, and office space provides TAFB with an opportunity to relocate and consolidate numerous Oklahoma City Air Logistics Center maintenance activities into one facility that would be known as the Tinker Aerospace Complex (TAC). However, due to the fact that the former General Motors facility has only very recently been leased by TAFB, a Master Plan for the property has not been finalized, and a specific portion of the facility cannot be identified by Tinker Civil Engineering as an alternative site.

Several open areas on the proposed TAC property contain adequate space to build a fully-contained Small Arms Range. However, other uses for these areas are still in the planning stages, such as extending a road from TAFB to the open area in the northeast corner of the property, or building additional parking facilities in the large open areas on the south side of the property. Due to the unresolved nature of the proposed plans at the time of this EA, the proposed TAC property will not be carried forward as an alternative. When TAFB completes the Master Plan for the proposed TAC property, this EA could be re-evaluated to carry forward and fully evaluate the impacts associated

with selection of the TAC property as a viable alternative for the construction of a fully-contained Small Arms Range.

2.5 REASONABLY FORESEEABLE CONCURRENT ACTIONS

Implementation of the Proposed Action and associated potential environmental impacts would occur concurrently with other projects and developments proposed on TAFB in the vicinity of the Proposed Action. These other proposed projects include:

Demolition of TAFB facilities due to the acquisition of TAC (FY 2010-2018). Approximately 1.2 million square feet of TAFB facilities will be vacated due to processes being relocated to TAC. The timeline for demolition of specific facilities will be determined at a later date.

Construction of Phase III, 3rd Combat Communication Complex (FY-11). A new Squadron Operations Complex will be designed and constructed for the 32nd Combat Communications Squadron at TAFB. The new facility would replace 13 substandard existing facilities. The new consolidated facility would enhance the squadron's capability to train, maintain its equipment, and to deploy to any location in the world. The site for this complex is east of Air Depot and north of Reserve Road.

Consolidated Security Forces, South Forty Development (FY-11). A new facility will be constructed to relocate and consolidate key Security Police Operations functions at a single facility. This 64,000 square feet facility will be built on the south side of TAFB.

These projects and the associated cumulative impacts are further discussed and analyzed in Section 5, Cumulative Impacts.

2.6 SUMMARY OF POTENTIAL IMPACTS

Potential impacts are evaluated and described in Section 4, Environmental Consequences. These potential impacts include:

- Short term impacts from dust emissions from construction
- Potential soil erosion and short-term storm water impacts from construction
- Potential for lead-contaminated soils to meet the definition of hazardous waste, requiring management per United States Environmental Protection Agency requirements
- Structures to be demolished may contain asbestos containing material (ACM)
- Construction debris may contain lead based paint
- Temporary impacts from noise associated with construction
- Interior noise impacts are anticipated, due to the fully-contained facility

TAFB personnel have indicated the Small Arms Range may be constructed by either a governmental entity, or by a non-governmental entity through the Enhanced Use Leasing program established by Title 10, USC 2667. However, it is understood that the environmental impacts associated with the Action will be the same regardless of the construction entity, and these environmental impacts will be addressed in the EA.

2.7 PROPOSED ACTION AS ONLY ALTERNATIVE

As noted previously, no definitive alternative actions have been identified by TAFB Civil Engineering for the new Small Arms Range. The proposed action is the only alternative identified at this time. **Figure 2-1** is a drawing of the proposed new Small Arms Range, and **Figure 2-2** is an aerial photograph of the existing Small Arms Range.

2.8 ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION

A summary of the anticipated environmental effects of the proposed action are shown in **Table 2-1**. The potential environmental impacts are evaluated and described in Section 4, Environmental Consequences.

2.9 MITIGATION MEASURES

Proposed mitigation measures to reduce or lessen the probable impact of implementing the proposed action are shown in **Table 2-2**.

3.0 AFFECTED ENVIRONMENT

This section describes the existing environment within the area potentially affected by the Proposed Action and the No-Action Alternative. In compliance with NEPA, CEQ regulations, UFC 3 260-01, and 32 CFR 989, the description of the affected environment focuses on only those aspects potentially subject to impacts (Air Force Civil Engineer Support Agency [AFCESA] 2006).

In the case of the Proposed Action, the affected environment description is limited primarily to TAFB and Oklahoma County. Resource descriptions focus on the following areas: air quality, water resources, hazardous material and hazardous waste, contaminated soils, asbestos and lead based paint, biological resources, cultural resources, geology, and noise.

3.1 AIR QUALITY

3.1.1 Definition of Air Quality

Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. The levels of pollutants are generally expressed on a concentration basis in units of part per million (ppm) or micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). For this air quality analysis, the region of influence centers on Oklahoma County, Oklahoma, where TAFB is located.

The baseline standards for pollutant concentrations are the National Ambient Air Quality Standards (NAAQS) and state air quality standards. These standards represent the maximum allowable atmospheric concentrations that may occur and still protect public health and welfare.

3.1.1.1 Criteria Pollutants

Air quality is affected by emissions from stationary sources (e.g., industrial development) and mobile sources (e.g., motor vehicles). Air quality at a given location is a function of several factors, including the quality and type of pollutants emitted locally and regionally, and the dispersion rates of pollutants in the region. Primary factors affecting pollutant dispersion are wind speed and direction, atmospheric stability, temperature, the presence or absence of inversions, and topography.

Ozone. Ground level ozone is an air pollutant with harmful effects on the respiratory systems of animals and humans. Ozone in the upper atmosphere filters potentially damaging ultraviolet light from reaching the Earth's surface. It is present in low concentrations throughout the Earth's atmosphere. The majority of ground level (terrestrial) ozone is formed as a result of complex photochemical reactions in the atmosphere involving volatile organic compounds, nitrogen oxides, and oxygen. Ozone is a highly reactive gas that damages lung tissue, reduces lung function, and sensitizes the lung to other irritants. Although stratospheric ozone shields the earth from damaging

ultraviolet radiation, terrestrial ozone is a highly damaging air pollutant and is the primary source of smog. As of June 2004, the United States Environmental Protection Agency (EPA) issued the final rule for 8-hour ozone, revising the 1-hour ozone NAAQS standard. The 8-hour standard is more protective of public health and more stringent than the 1-hour standard, and non-attainment areas for 8-hour ozone are now designated.

Carbon Monoxide. Carbon monoxide (CO) is a colorless, odorless, tasteless yet highly toxic gas. Its molecules consist of one carbon atom covalently bonded to one oxygen atom. There are two covalent bonds and a coordinate covalent bond between the oxygen and carbon atoms. Carbon monoxide is produced from the partial combustion of carbon-containing fuels. The health threat from CO is most serious for those who suffer from cardiovascular disease, particularly those with angina and peripheral vascular disease.

Nitrogen Dioxide. Nitrogen dioxide (NO₂) is a highly reactive gas that can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections. Repeated exposure to high concentrations of NO₂ may cause acute respiratory disease in children. Because NO₂ is an important precursor in the formation of ozone or smog, control of NO₂ emissions is an important component of overall pollution reduction strategies. The two primary sources of NO₂ in the United States are fuel combustion and transportation.

Sulfur Dioxide. Sulfur dioxide (SO₂) belongs to the family of sulfur oxide gases (SO_x). These gases dissolve easily in water. Sulfur is prevalent in all raw materials, including crude oil, coal, and ore that contains common metals like aluminum, copper, zinc, lead, and iron. SO_x gases are formed when fuel containing sulfur, such as coal and oil, is burned, and when gasoline is extracted from oil, or metals are extracted from ore. SO₂ dissolves in water vapor to form acid, and interacts with other gases and particles in the air to form sulfates and other products that can be harmful to people and their environment.

Particulate Matter (PM₁₀ and PM_{2.5}). "Particulate Matter," also known as particle pollution or PM, is a complex mixture of extremely small particles and liquid droplets. Particle pollution is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The size of particles is directly linked to their potential for causing health problems. EPA is concerned about particles that are 10 micrometers in diameter or smaller because those are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. EPA groups particle pollution into two categories:

- “Inhalable coarse particles” (PM_{10}), such as those found near roadways and dusty industries, are larger than 2.5 micrometers and smaller than 10 micrometers in diameter.
- “Fine particles” ($PM_{2.5}$), such as those found in smoke and haze, are 2.5 micrometers in diameter and smaller. These particles can be directly emitted from sources such as forest fires, or they can form when gases emitted from power plants, industries and automobiles react in the air.

Airborne Lead. Airborne lead can be inhaled directly or ingested indirectly by consuming lead-contaminated food, water, or non-food materials such as dust or soil. Airborne lead can be created in Small Arms Ranges by:

- Exploding lead primers
- Friction from the lead slug against the gun barrel
- Lead slugs hitting the bullet trap, walls, floors or ceiling of the range
- Spent bullets and settled dust
- Poor indoor range ventilation

When instructors or shooters are in the firing range, lead dust can settle on their bodies, hair, clothes, and shoes. That dust can be carried to their cars and homes where it can harm their family and children. Lead is a strong poison that serves no known use once absorbed by the body, and has been identified as a factor in high blood pressure and heart disease. Exposure to lead at enclosed ranges has been reduced drastically in the last 15 years by properly filtered ventilation systems, improved personal hygiene, and using appropriate methods to clean the range.

3.1.1.2 Clean Air Act Amendments (CAAA)

Although the 1990 CAA is a federal law covering the entire country, the states have the primary responsibility of implementing the Act. For example, a state air pollution agency holds a hearing on a permit application by a power or chemical plant or fines a company for violating air pollution limits. Under this law, the EPA sets limits on how much of a pollutant can be in the air anywhere in the United States. States are not allowed to have weaker pollution controls than those set for the whole country. The law recognizes that states should take the lead in implementing the CAA, because pollution control problems often require special understanding of local industries, geography, housing patterns, etc. States must develop state implementation plans (SIPs) that explain how each state enforces the CAA. The states are obligated to notify the public of these plans, through hearings that offer opportunities to comment, in the development of each SIP. EPA must approve each SIP, and if a SIP isn't acceptable, EPA can take over as the lead agency responsible for implementation of the CAA in that state. The United States government, through EPA, assists the states by providing scientific research, expert studies, engineering designs and funding to support clean air programs.

3.1.2 Existing Conditions

3.1.2.1 Climate

Oklahoma County is part of the Central Great Plains in the western parts of the county and transitions to Crosstimbers regions in the eastern parts of the county. Average annual precipitation ranges from about 33 inches over much of Oklahoma County to 36 inches in the far eastern parts of the county. October and June are the wettest months, on average, but much of the spring through fall receives sufficient rainfall. About every one year in three has at least one inch of snow, with one year in ten having ten or more inches. Temperatures average near 60 degrees, with a slight increase from north to south. Temperatures range from an average daytime high of 93 degrees in July to an average low of 26 degrees in January. Oklahoma County averages a growing season of 219 days, but plants that can withstand short periods of colder temperatures may have an additional three to six weeks. Winds from the south to southeast are quite dominant, averaging just over seven miles-per-hour. Relative humidity, on average, ranges from 41% to 92% during the day. During the year, humidity is highest in May and lowest in February through April. Winter months tend to be cloudier than summer months. The percentage of possible sunshine ranges from an average of about 55% in winter to nearly 80% in summer.

Thunderstorms occur on about 49 days each year, predominantly in the spring and summer. During the period 1950 - 2003, Oklahoma County recorded 86 tornadoes. On May 3, 1999 an F5 tornado passed through the Oklahoma City metro area. This tornado was one of the costliest and deadliest natural disasters in United States history, resulting in 36 people killed and 583 injured. May 8, 2003 also brought a significant F4 tornado which followed almost the same path as the May 3, 1999 tornado. There were no deaths but there were 134 injuries. Typically, there are about 4 events each year of hail exceeding one inch in diameter. As information has improved, the reported numbers of tornadoes and severe hail events have increased.

3.1.2.2 Local Air Quality

Central Oklahoma has a long history of good air quality thanks in part to involvement in the voluntary programs offered by EPA. In addition to participating in educational efforts such as the Clean Air Alert Day Program, the Central Oklahoma Clean Cities (alternate fuels) program and the annual public education campaign, leaders in the Oklahoma City Metropolitan area have committed or participated in previous initiatives such as the carbon monoxide Flexible Attainment Region program, and the 1-Hour Ozone Flex program.

The 8-O₃ Flex program is the third generation of voluntary ozone programs designed to allow participating communities greater flexibility when selecting emission reduction programs and strategies. By providing local control of the process, these programs recognize that each region has

distinct emission characteristics and socioeconomic variables that make a standardized approach unrealistic and unrepresentative.

Working together with local, state, and federal officials, some of the essential facets of the 8-O₃ Flex Plan include early planning, implementation of emission reduction measures, broad-based public input and local control, and state support to ensure the technical integrity of the plan.

During the past several years, air quality planning in the Central Oklahoma area has intensified as ozone concentrations have periodically exceeded the value permitted by the 8-hour ozone NAAQS. Based on data collected by ODEQ in 2003, EPA declared that all areas in Oklahoma appear to demonstrate attainment for the 1-hour and the 8-hour ozone standards. In March 2004, EPA made final designations that Central Oklahoma was in attainment of the 8-hour ozone standard. The 8-hour ozone design value is determined by averaging three years of the fourth highest 8-hour ozone levels in an area. This number, called the design value, must be lower than .085 parts million (ppm) to meet the standard. Currently, the Central Oklahoma design value (averaging 2004, 2005, and 2006) is .081 ppm. Despite annual fluctuations and observed improvements in the design value, it is understood that long-term air quality may not improve without a concerted emission-reduction effort.

3.1.2.3 TAFB and the Proposed Project Location

TAFB is located in Oklahoma County, which is in the 8-O₃ Flex program with the EPA, as described in the preceding section of this EA. The DEQ publishes regulations for air quality and permitting for all counties in Oklahoma and has jurisdiction over and regulates air emissions associated with TAFB.

The Title V Operating Permit Program under the CAAA imposes requirements for air quality permitting of air emission sources. TAFB is categorized as a major source under the Title V program because its potential emissions from stationary sources exceed 100 tons per year of any of the criteria pollutants, or 10 tons per year of any single Hazardous Air Pollutant (HAP), or 25 tons per year of any combination of HAPs. The National Emission Standards for Hazardous Waste Pollutants, (NESHAP) program, also under the CAAA, specifies various provisions for regulated sources, including limits on HAP emissions, compliance demonstrations and performance testing, monitoring, record keeping, and reporting. The NESHAP program applies to TAFB since potential emissions of any single HAP equals or exceeds 10 tons per year and a combination of HAPS equals or exceeds 25 tons per year. TAFB maintains a Title V Air Permit (December 2006).

The NESHAP program also regulates all asbestos removal and demolition, enforced by the DEQ. Before demolition of any structure, an asbestos inspection must be performed by an asbestos professional licensed by the DEQ. If asbestos is present, asbestos abatement must be performed by

a licensed asbestos abatement firm. If asbestos is found or determined not to be present, the DEQ requires a NESHAP notification to be submitted to the air quality division of DEQ a minimum of 10 working days before demolition activities commence.

TAFB presently tracks and manages over 1000 air emission sources. TAFB's Geographic Information System links to the air database maintained on base and overlays a digitally correct map of the emission sources. The primary emission sources include:

- Stationary combustion sources (boilers, water heaters, furnaces, gasoline and diesel-fuel generators, arresting barrier engines, engine test cells);
- Operational sources (chemical usage, paints, degreasers, woodworking, abrasive blasting, welding operations, fuel cell maintenance, wastewater treatment, small arms firing range);
- Fuel storage/transfer operations, (horizontal tanks, internal floating roof tanks, fuel transfer losses); and
- Mobile sources (vehicle operations, aircraft operations, trim and power checks, aerospace ground equipment).

The proposed Small Arms Range would be developed on property located east of Air Depot Boulevard that is owned by TAFB. No activities or development occurs on or adjacent to this property that generates emissions uncharacteristic of the base or regional environment.

3.2 WATER RESOURCES

3.2.1 Definition of Water Resources

Water resources analyzed in this EA include surface and groundwater resources, including the quality and availability of surface and groundwater, wetlands, and the potential for flooding. Surface water resources include lakes, rivers, and streams and are important for a variety of reasons including economic, ecological, recreational, and human health. In this document, surface water also encompasses storm water, and any potential storm water impacts from construction activities. Groundwater includes the subsurface hydrologic resources of the physical environment and is an essential resource in many areas; groundwater is commonly used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater properties are often described in terms of depth to aquifer, aquifer or well capacity, water quality, and surrounding geologic composition.

Other issues relevant to water resources include watershed areas affected by existing and potential runoff, and flooding hazards associated with 100-year floodplains. Floodplains are belts of low, level ground present on one or both sides of a stream channel and are subject to either periodic or infrequent inundation by flood water. Inundation dangers associated with floodplains have prompted Federal, state, and local legislation that limits development in these areas largely to recreation and

preservation activities. EO 11988, Floodplains Management, requires actions to minimize flood risks and impacts. Under this order, development alternatives must be considered and building requirements must be in accordance with specific federal, state, and local floodplain regulations.

3.2.2 Existing Conditions

3.2.2.1 Regional Setting

Surface Water. Oklahoma County's landforms eventually drain into the Arkansas River. The northern portion of the County drains into the Crutcho Creek Drainage Basin and into the North Canadian River, and the southern portion drains into the Elm Creek and Hog Creek Drainage Basins and into the South Canadian River, both of which are headwaters for the Arkansas-Mississippi River Basin. The North Canadian River runs west to east through Oklahoma County. (U.S. Fish and Wildlife Service [USFWS] 2006).

Several drainage corridors traverse Oklahoma County close to TAFB, including Brock Creek, East Elm Creek, Crutcho Creek, West Hog Creek, East and West Forks of Wildhorse Creek, Bluff Creek, Walnut Creek, and Soldier Creek. Surface waters occur in three main stream systems, one which drains to the north (Crutcho Creek with Kuhlman and Soldier Creek tributaries) and two to the south (East Elm Creek and West Hog Creek). The north-flowing stream system originates approximately 2 miles south of TAFB's current southern boundary with on-base portions of the system comprising 12 smaller, first-order tributaries; two larger, second-order tributaries; and one main, third-order tributary. The south flowing systems consist of only first- and second-order tributaries located off base land. Several other minor creeks and draws feed into the above mentioned major creeks (Oklahoma Water Resources Board [OWRB] 2006).

Groundwater. Aquifers which underlay Oklahoma County include both ephemeral (short-lived) and perennial (lasting the entire year) aquifers. The most important source of portable groundwater in the Oklahoma City metropolitan area is the Central Oklahoma Aquifer system. This aquifer extends under much of central Oklahoma and includes water in the Garber Sandstone and the Wellington Formation, the overlying alluvium and terrace deposits, and the underlying Chase, Council Grove, and Admire Groups. The Garber Sandstone and the Wellington Formation portion of the Central Oklahoma Aquifer system is referred to commonly as the "Garber-Wellington Aquifer" and is considered to be a single aquifer because these units were deposited under similar conditions. Many of the best producing water wells are completed in this zone. On a regional scale, the aquifer is confined above by the less permeable Hennessey Group and below by the Late Pennsylvanian Vanoss Group. The regional dip of these formations is generally to the west (Parkhurst et al. 1993).

TAFB lies within the recharge area of the Garber-Wellington Aquifer. The direction of the regional water table gradient under TAFB varies from west/northwest to southwest, depending on location, and has a magnitude ranging from 10 to 30 feet per mile (Christenson et al. 1992). However, determination of horizontal gradients is made difficult by the presence of a downward component of flow in the Garber-Wellington Aquifer. Both direction and magnitude of groundwater flow can be highly variable, both spatially and temporally, due to local variations in geology, sources of recharge, and the interaction between the shallow aquifer and streams. The aquifer is recharged primarily by infiltration of rainfall or surface water through fractures in the Fairmont Shale and directly into the Garber Sandstone (OWRB 2006).

The depth to the aquifer at TAFB ranges from a few feet to about 70 feet below ground surface (bgs), depending on local topography. Across the county, water can sometimes be found in shallow, thin, discontinuous perched zones located above the aquifer. Most water from the Garber-Wellington Aquifer is of sufficient quality to be used for most industrial, agricultural, and domestic purposes. However, some contaminated groundwater plumes do exist at TAFB, typically at a depth of 175 feet or shallower. This does not pose health concerns at this time since the producing zone (i.e., depth at which water supply wells obtain water) is 200 feet or deeper. Also, there appears to be an aquitard located at an approximate depth of 200 feet which hydraulically separates the producing zone from shallower groundwater in the aquifer at TAFB (TAFB 2001).

Since 2004, TAFB derives all of its water supply from the aquifer. Industrial operations, individual homes, farm irrigation, and small communities not served by municipal distribution systems also depend on the Garber Wellington Aquifer. Communities presently depending on surface supplies, such as Oklahoma City, Midwest City, and Del City, maintain wells tapping the Garber-Wellington Aquifer as a backup water supply in the event of drought.

Wetlands. Wetlands are defined by the U.S. Army Corps of Engineers (USACE) and EPA as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. As defined in 1984, wetlands generally include swamps, marshes, bogs, and similar areas (33 CFR 328.3 [b]). Wetlands provide a variety of functions including groundwater recharge and discharge, flood flow alteration, sediment stabilization, sediment and toxicant retention, nutrient removal and transformation, aquatic and terrestrial diversity and abundance, and uniqueness. Three criteria are necessary to define wetlands, i.e., vegetation (hydrophytes), soils (hydric), and hydrology (frequency of flooding or soil saturation). Hydrophytic vegetation is classified by the estimated probability of occurrence in wetland versus upland (non-wetland) areas throughout its distribution. Hydric soils are those that are saturated, flooded, or

ponded for sufficient periods during the growing season and that develop anaerobic conditions in their upper horizons (i.e., layers). Wetland hydrology is determined by the frequency and duration of inundation, soil saturation, and wetland establishment and proliferation. Jurisdictional wetlands are those subject to regulatory authority under Section 404 of the CWA; EO 11990, Protection of Wetlands, requires analyses of potential impacts to wetlands related to proposed Federal actions.

Wetlands represent approximately 2 percent of the land area in Oklahoma (EPA 2006). Several wetlands are located in Oklahoma County. National Wetland Inventory (NWI) maps for the area indicate that these wetlands are primarily freshwater emergent, freshwater forested/shrub, freshwater pond, and riverine (USFWS 2006).

Floodplains. Flood hazard areas of Oklahoma County are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental service, and extraordinary public expenditures for flood protection and relief, all of which adversely affect public expenditures for flood protection and relief, all of which adversely affect public health, safety, and general welfare. The bulk of Federal Emergency Management Agency (FEMA) designated floodplains, 100-year and 500-year, for Oklahoma County exist along the North Canadian River and its major tributaries. However, no FEMA-designated floodplains exist along the smaller, intermittent streams (OWRB 2006).

The Floodplain Board of Oklahoma County appoints a County Floodplain manager who administers and implements regulations and other appropriate sections of 44 CFR (National Flood Insurance Program Regulations) pertaining to floodplains management. The duties and responsibilities of the floodplain board are to adopt, administer, and enforce floodplain management regulations which: (a) Delineate floodplain and floodways, and delineate 100-year flood elevations within all unincorporated areas of the County (these delineations shall be submitted to the OWRB); (b) Preserve the capacity of the floodplain to carry and discharge regional floods; (c) Minimize flood hazards; and (d) Regulate the use of the land in floodplain (OWRB 2006).

3.2.2.2 TAFB and Proposed Project Location

Surface Water. Surface drainage at TAFB occurs in three primary drainage basins: 1) Crutcho Creek Drainage Basin, 2) Elm Creek Drainage Basin, and 3) Hog Creek Drainage Basin. These are further divided into 10 sub-basins or watersheds, as indicated in **Figure 3-1**. The majority of land associated with TAFB is drained by the Crutcho Creek Drainage Basin which flows to the north into the North Canadian River. The Elm Creek and Hog Creek Drainage Basins flow to the south of the base into the Little River which forms confluences with the South Canadian River (TAFB, 2007a).

On-base, open-flowing waters comprise a total of about eight linear miles. The first and second order segments are typically ephemeral or intermittent, while the third-order segment is perennial. All base creek flows are the result of stormwater runoff (TAFB 2007). Stormwater runoff is collected by various diversion structures and discharged to surface streams. Approximately 5 miles of stream channels within TAFB lie within the 100-year floodplain (USAF 1991).

No significant point industrial discharges currently are made to any waterway on TAFB. In 1996, the base Industrial Wastewater Treatment Plant (IWTP) and Sanitary Treatment Plant discharges were rerouted to the Oklahoma City Public Owned Treatment Works. This eliminated flows of 1.3 million gallons per day to the on-base portion of Soldier Creek (i.e., East Soldier Creek) at National Pollutant Discharge Elimination System (NPDES) Outfalls 001 and 01S. (TAFB 2007)

The site proposed for the Small Arms Range lies east of Upper Crutch Creek. The area of the watershed south of this site, estimated from a 7.5 minute US Geological Survey topographic map, is about 10 acres.

Surface water degradation has occurred on TAFB and is considered to be non-point source pollution associated with runoff events (TAFB 2007). Probable sources include sediment from soil erosion associated with construction/demolition activities; runoff from parking lots; fertilizers and pesticides from lawns, grounds, and golf courses; industrial spills; and deicing compounds from roadways, taxiways, runways, ramp areas, and aircraft (TAFB 2007).

TAFB is required by the DEQ to possess storm water discharge permits, and will be required to obtain coverage under the Oklahoma General Permit for storm water associated with construction activities prior to commencing the proposed action.

Groundwater. The direction of groundwater flow under TAFB varies. There is an apparent groundwater divide associated with Crutch Creek that affects groundwater flow direction. Regional topographic lows draw portions of groundwater in the area southwestward, while other areas flow northward toward discharge points along Crutch Creek (TAFB 2001).

Throughout much of the northern half of the base, the Garber-Wellington Aquifer is not protected by any confining shale. In the southern half of the base, the Hennessey Group overlies the aquifer and acts as a confining layer because it is typical clay-rich, low-permeability shale. The confining nature of the Hennessey Group causes rainfall to remain near ground surface and flow into five hydrogeologic zones: the Hennessey Water Bearing Zone, the Upper Saturated Zone (USZ), the Lower Saturated Zone (LSZ), the Lower-Lower Saturated Zone (LLSZ), and the Production Zone (PZ). The USZ and

LSZ are regionally considered to be in the upper third of the Garber-Wellington Aquifer, and generally are present at depths of less than 200 feet below ground surface. The PZ is used for water supply at TAFB (TAFB 2001). TAFB is located in a recharge area for these water-bearing zones; groundwater is derived primarily from precipitation and from infiltration of surface streams.

Groundwater at TAFB is found under either water table or confined conditions. The depth to water ranges from a few feet to about 70 feet below ground surface depending on the local topography. Across TAFB, water can sometimes be found in shallow, thin, discontinuous perched zones located above the aquifer.

The approximate direction of groundwater flow in the Garber-Wellington aquifer is south and southwest across the southern half of the base and west to northwest across the northern half. Shallow groundwater may discharge to surface streams (gaining stream) or be recharged by streams (losing stream) (OWRB 2006). Both situations occur at TAFB along Crutch Creek and Soldier Creek. In contrast, water in the Hennessey Water Bearing Zone generally flows to the northeast toward Crutch Creek from higher topographic areas along the south boundary of the base (TAFB 2002).

Wetlands. In 1995, approximately 65 acres of wetlands were identified on TAFB by USFWS using NWI criteria. These wetlands included creeks, ponds, drainage swales, and other wet areas. Of the 65 acres, 7.9 acres were later classified by the USACE as jurisdictional wetlands under the CWA. The 7.9 acres were divided among five (5) wetland areas: Ground Water Treatment Plant (GWTP) wetland (0.5 acres), Fuel Control Facility (FCF) wetland (0.8 acres), Greenway wetland (4.8 acres), Compressed Natural Gas (CNG) wetland (0.3 acres); and the Glenwood wetland (1.5 acres, on-base portion only). This excluded the off base portion (8.5 acres) of the Glenwood wetland which was located immediately adjacent to and east of the base on county and private land (TAFB 2007). In 2002, these 65 acres (73 individual wetland areas) were reassessed to track their status and trends (Wetland Study Report for TAFB, Oklahoma, May 2003). Based on the survey, only two wetlands (i.e., Greenway and Prairie Pond) were classified as intermediate quality, and six as low quality. This study also determined that 31 of the original 73 NWI wetland areas no longer existed or were actually drainage ditches or wet weather conveyances that did not function as wetlands or aquatic habitat and therefore were not included in the survey. These non-wetland areas covered approximately 27 acres and most were within the airfield or other highly industrialized areas of the base. Therefore, the current total NWI acreage on Tinker is estimated at 38 acres. These have not been officially "delisted" as wetlands by the USFWS who conducted the original study (TAFB 2007).

In 1999, the Glenwood wetland was drained because it attracted waterfowl which presented a bird/wildlife aircraft strike hazard. This reduced the total on base wetland acreage to 6.4 acres.

Mitigation for the Glenwood wetland removal included the construction of wetlands in the cities of Choctaw (two wetlands totaling approximately 2.3 acres) and McCloud (approximately 3 acres), at Oklahoma Eagle Ridge Institute in Oklahoma City (approximately 3 acres); and at the Kids-We-Care site (three wetlands totaling approximately 10 acres) south of Guthrie, Oklahoma (TAFB 2007).

All jurisdictional wetlands on TAFB were man-made with the exception of the Glenwood wetland, which was created by beaver activity. The GWTP wetland is located on a Superfund site and therefore is regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) by the EPA. The vegetation and soils of the GWTP wetland were removed in 1999 as part of a Soldier Creek remediation effort (TAFB 2005).

No wetlands are located near the proposed Small Arms Range Site. The Greenway wetland is located approximately 1/3 of a mile northeast of the location for the proposed Small Arms Range, west of Air Depot Boulevard, on the north side of Crutcho Creek. Additionally, there are NWI wetlands located approximately 600 feet south of the proposed site. See **Figure 3.2**. The Greenway wetland would not be impacted by the demolition of the existing range and the construction of a new range.

Floodplains. In October 2002, USACE, Tulsa District, completed a study for TAFB to update the 100-year and 500-year floodplains. The 100-year and 500-year floodplains were reassessed for the Middle Branch, Upper Crutcho Creek (the Eastern Branch), and Upper Crutcho Creek, (Western Branch) (USACE 2002). Crutcho Creek and its tributaries and Kuhlman creek are bounded by 100-year and 500-year floodplains designated by FEMA. These floodplains affect approximately 520 acres of base land (TAFB 2007). The bulk of these floodplains are located along Crutcho Creek. However, no FEMA-designated floodplains exist along the smaller, intermittent streams that exist on the base (USACE 2002). No 100-year or 500-year floodplains have been designated on the proposed project site. See **Figure 3-3**.

Regarding floodplain functions, the overall general status of TAFB's 100-year and 500-year floodplain is poor. However, the trend is upward because of conversion of some floodplain improved and semi-improved grounds to natural areas in recent years. Although no specific monitoring of floodplain functions has been accomplished in the past, projects are scheduled to provide the foundational data for measuring progress towards development of a healthy floodplain on TAFB (TAFB 2007).

3.3 HAZARDOUS MATERIALS AND HAZARDOUS WASTE

3.3.1 Hazardous Materials

In the performance of its mission, TAFB consumes a large amount of environmentally hazardous materials (HAZMAT). TAFB operates a Hazardous Materials Management Program (HMMP) to manage the procurement and use and eventually the disposal of hazardous materials. The HMMP functions through the use of a decentralized HAZMAT Cell and many Hazardous Materials Issue Points. The pharmacy concept ensures that the proper amount of hazardous materials is issued for control and use. The Issue Points do this by using a hazardous materials electronic tracking system to ensure materials are issued only to authorized users, in authorized zones, and for authorized tasks.

3.3.2 Hazardous Waste

TAFB is a large quantity hazardous waste generator. Waste management procedures are set out in OC-ALC-TAFB Instruction 32-7004 (15 August 2001). TAFB also holds a Part B permit for its Hazardous Waste Storage Facility (HWSF) issued by DEQ (effective July, 2001). TAFB may store a total volume of 159,390 gallons of waste. TAFB generated approximately 1,806 tons of hazardous waste in 2006. The HWSF is used for storage only; no treatment or disposal takes place on TAFB. The HWSF is located approximately 4,000 feet south of the Proposed Action site.

3.3.3 Soil Contamination

Small Arms Ranges for weapons training are essential to the mission of many USAF facilities. Their use, however, often produces an undesirable environmental condition, lead-contaminated soil. This becomes a problem when the range requires remediation and the soil becomes a hazardous waste. The need for remediation can result from maintenance activities, closure of a range, demolition of range structures, or construction of new facilities.

Under Resource Conservation and Recovery Act (RCRA) regulations, materials containing lead concentrations of 5 mg/l or greater by the toxicity characteristic leaching procedure (TCLP) metals method are classified as characteristic hazardous waste. In 1995, approximately 800 tons of lead-contaminated soil was removed from the bullet trap area at Building 1024 and transported to a hazardous waste landfill for disposal. Clean soil was imported from offsite to backfill the excavation. Additional assessment of the project action site will be required, including additional lead sampling in the area of Buildings 1024 and 1025 to characterize the soil to ensure that all lead-contaminated soil is remediated before demolition of the existing structures.

3.3.4 Environmental Restoration Program

The Secretary of Defense established the Defense Installation Restoration Program (IRP) (present-day ERP) in 1981 to investigate and remediate hazardous waste sites at DoD facilities. The USAF subsequently established its IRP to locate and investigate hazardous waste sites on its installations. The IRP execution strategy is to protect human health and the environment, satisfy legal agreements, and have all sites closed or remedies in place by the end of FY 2014. However, TAFB achieved this milestone in 2008. TAFB began its IRP in 1980 with the completion of a Preliminary Assessment (PA) of 14 sites. Various base-wide surveys identified other potential IRP sites and additional PAs were conducted for these sites. A total of 40 IRP sites including landfills, fire training pits, radioactive waste disposal sites, fuel storage areas, industrial waste pits, and the IWTP, have been identified at TAFB since the beginning of the IRP (TAFB 2005). A total of 23 of the IRP sites are addressed under RCRA guidance and four are addressed under CERCLA as operable units on the National Priorities List. Numerous remedial investigations/feasibility studies, RCRA facility investigations, corrective measure studies, and interim response actions have been conducted at various sites on the base. Seventeen of the 40 sites have been closed, and no further action is required. No IRP (or ERP) sites are located in the vicinity of the proposed project site.

3.3.5 Toxic Materials

Radon. Radon gas has been identified at TAFB. However, recorded radon levels are well below the EPA action level of 4 picoCuries per liter (pCi/L).

Asbestos. Asbestos-containing materials (ACMs) have been used throughout TAFB to increase the fire resistance of buildings materials and for thermal insulation. The Asbestos Operating Plan and Asbestos Management Plan define base policies and procedures for accomplishing asbestos related projects and ensure compliance with federal and state regulations.

Lead Based Paint. In 1987, U. S. Department of Defense (DoD) banned the use of lead based paint (LBP) in all of its facilities. LBP was used extensively, however, at most facilities constructed before 1987. Buildings at TAFB that were constructed before 1987 may have one or more coatings of LBP.

3.4 BIOLOGICAL RESOURCES

3.4.1 Definition of Biological Resources

Biological resources include native or naturalized plants and animals and the habitats in which they occur. Sensitive biological resources are defined as those plant and animal species listed as threatened or endangered, candidate, rare, and other sensitive flora and fauna, or proposed as such, by the USFWS and respective State agencies. Federal and State Species of Concern are not protected by law; however, these species could become listed or protected at any time if not properly

managed. Threatened and endangered species are federally protected plants and animals that are in danger of becoming extinct without protection. These species may be rare because of specialized habitat needs or habitat destruction. The Endangered Species Act of 1973 protects listed species against killing, harming, harassment, or any action that may damage their habitat.

3.4.2 Regional Setting

The landscape of Oklahoma County is characterized by level to gently rolling hills, broad flat plains, and bottomlands intersected by small to medium sized watercourses. The County is part of the Cross Timbers Vegetation Area of the Midwest and the Central Oklahoma /Texas Plains or Central Great Plains.

Vegetation. Oklahoma has a diversity of vegetative communities and species of plants. There are 173 families, 868 genera, and 2,540 species of vascular plants reported for the state. Bailey (1995) lists seven distinct ecoregions occurring in Oklahoma. The project area is located in central Oklahoma within Bailey's Prairie Parkland (Subtropical) Province (2512). This province is quite large, encompassing an area running from the Canadian border in the north and south to the Texas Gulf Coast. It consists of prairies and savannas and forms an ecotone between the forested areas of the eastern United States and the grassland areas of the Southern Great Plains to the west. Prior to settlement, the TAFB area was probably dominated by prairie grasses consisting of species such as big bluestem, little bluestem, switch grass, Indian grass, and various forbs and legumes. However, after settlement and subsequent development, very little of the original vegetative community remains intact. Within the areas that have been converted to urban and industrial use, the plant community is comprised primarily of turf grasses and ornamental trees and shrubs. The predominant turfgrass on TAFB is Bermuda grass. Native buffalo grass is often found mixed with Bermuda grass. Other more rural areas are typically a mixture of exotic and native plants. Trees and shrubs are composed of native and exotic plants, and, contrary to pre-settlement plant distribution, many woody plants are found on upland as well as bottomland sites (TAFB 2001). At the proposed project location, the grasses around the existing range are dominated by Bermuda grass, with a small amount of native grasses mixed in. The only rare plant species found on TAFB is the Oklahoma penstemon. The Oklahoma penstemon is a perennial cool season forb which grows in mixed native and nonnative prairies. A population exists on TAFB, but no penstemons are located on the Proposed Action site.

Wildlife. Approximately 350 native vertebrate species and a much greater unknown number of invertebrates have historically occurred either in the Central Oklahoma/Texas Plains or Central Great Plains Ecoregions (Oklahoma Dept. of Wildlife Conservation 2007). Some species which probably occurred on this land during pre-settlement times include prairie dogs, bear, bison, wolves, elk, and

horses. Numerous other species have been displaced by urban and industrial activities on and around TAFB.

According to the USFWS (2007), there are three federally-listed threatened or endangered species occurring in Oklahoma County (Whooping Crane, Piping Plover, and Interior Least Tern). None of the three federally-listed species have been reported to occur on TAFB and are not expected to occur in the proposed action area (TAFB 2007). However, five faunal species are classified as “State Species of Special Concern”, and documented sightings have occurred on TAFB (see **Figure 3-5**). The sensitive species are the Barn Owl, Burrowing Owl, Migrant Loggerhead Shrike, Swainson’s hawk, and the Texas Horned Lizard. Based on locations of recorded sightings for sensitive species in the TAFB Integrated Natural Resources Management Plan (INRMP), no sensitive species have been recorded on the Proposed Action site. However, Swainson’s hawks are found throughout the base and have historically nested along Kuhlman Creek, south of the golf course, and could also inhabit the woodlands just south of the proposed site along Upper Crutch Creek.

The USFWS defines species of concern for the future well-being of the species, but the species does not receive any protection under the ESA. AFI 32-7064, Integrated Natural Resources Management, states that species having such a status should be considered in future planning and facility siting as well as provided protection wherever possible.

3.5 CULTURAL RESOURCES

Cultural resources are prehistoric and historic sites, districts, structures, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific traditional, religious, or other reasons. A historic district is an area that possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development.

The cultural resources at TAFB consist of an archaeological component and historic architectural component. The archaeological resources consist of two components, and are considered to be either prehistoric or historic. Two archaeological sites and two historic sites have been identified on the installation (TAFB 2007).

Historic architectural resources include any structures that are at least 50 years old. The two historic properties found on TAFB include facilities associated with aircraft construction modification from 1943 to 1946 (i.e., the Douglas Cargo Aircraft Manufacturing facilities) and facilities associated with the Cuban Missile Crisis, 1962. The Douglas Cargo facilities have been designated as an historic

district (TAFB 2007). These historic resources are located along the north and northeastern edges of the installation.

3.6 GEOLOGY

Geologically, Oklahoma County is located in the Interior Lowlands physiographic region, the Central Lowland physiographic province, and the Osage Plain physiographic sub province, (United States Department of Agriculture [USDA] and Natural Resources Conservation Service [NRCS] 2003). TAFB is located in an area believed to be a part of a shallow sea that once covered most of western Oklahoma. Consequently, the surficial geology is comprised primarily of sandstone and shale of sedimentary origins formed in the Permian age approximately 250 million years ago. The sandstones range in color from orange-red to reddish-brown and are fine-grained and poorly cemented. The grains are sub-triangular to sub-round and composed of quartz. Shale is reddish-brown and silty.

The Surface Geology Map of Oklahoma County shows TAFB to be dominated by the Garber Sandstone stratum with relatively smaller stratigraphic units of the Hennessey Group, Terrace Deposits and Alluvium (USDA and NRCS 1996). Wood and Burton (1968) reported that the base was almost exclusively underlain with the Hennessey Group (Kingman Siltstone and Fairmont Shale) with one small area underlain with the Garber Sandstone/Wellington Formation and one area with the Alluvium stratigraphic unit. A 1988 USACE report stated the Garber-Wellington Formation underlies the entire base but is overlapped by the Hennessey Group at the southern half of the base.

3.7 NOISE

Noise levels in the environment are usually expressed in terms of hourly equivalent sound pressure levels in terms of decibels on the A-weighted scale. When expressed in this manner, noise levels approximate the response of the human ear by filtering out some of the noise in the low and high frequency ranges that the ear does not easily detect. The A-weighted scale is also used in most local ordinances and standards.

The noise program is managed by the base civil engineering group. TAFB is bordered by Midwest City, Del City, and Oklahoma City. All of these cities have adopted noise ordinances for aircraft and transportation noise. The Air Installation Compatibility Use Zone (AICUZ) study was completed in 2006 and is reviewed annually (Draft External EOH CAMP, 2007).

4.0 ENVIRONMENTAL CONSEQUENCES

This section evaluates the potential environmental consequences resulting from implementation of the Proposed Action or the No-Action Alternative. The No-Action Alternative provides a baseline against which the impacts of the Proposed Action can be compared. Evaluations are presented by resource area, as presented in Section 3, Affected Environment.

4.1 AIR QUALITY

The 1990 Amendments to the CAA require that Federal agency activities conform to the SIP with respect to achieving and maintaining attainment of NAAQS and addressing air quality impacts. The EPA General Conformity Rule requires that a conformity analysis be performed which demonstrates that a Proposed Action does not:

- Cause or contribute to any new violation of any NAAQS in the area.
- Interfere with provisions in the SIP for maintenance or attainment of any NAAQS.
- Increase the frequency or severity of any existing violation of any NAAQS.
- Delay timely attainment of any NAAQS, any interim emission reduction, goals or other milestones included in the SIP for air quality.

A conformity review must be performed when a Federal action generates air pollutants in a region that has been designated a nonattainment or maintenance area for one or more NAAQS. Nonattainment areas are geographic regions where the air quality fails to meet the NAAQS. Maintenance areas are regions where NAAQS were to preserve and maintain the newly regained attainment status. Provisions in the General Conformity Rule allow for exemptions from performing a conformity determination if the total net increase in emissions of individual nonattainment or maintenance area pollutants resulting from implementation of the Proposed Action fall below the significant, i.e., *de minimis*, threshold values.

4.1.1 Proposed Action

Pollutant emissions associated with implementation of the Proposed Action at TAFB would include construction emissions (i.e., fugitive dust emissions) generated during ground disturbance and related demolition and site preparation activities, and combustion emissions from vehicles and equipment used during demolition of the existing structures and construction of the new building and parking area. However, construction emissions would be temporary and would not occur beyond completion of demolition and construction activities.

Construction Emissions. Dust emissions, under implementation of the Proposed Action, (i.e., PM₁₀, a criteria pollutant) would be generated during construction activities including vegetation removal, grading, and demolition. Dust emissions can vary substantially daily depending on levels of activity, specific operations, prevailing meteorological conditions, and use of best management practices for dust suppression. Based on similar studies at other facilities the expected emission rate is 1.2 tons of dust generated per acre per month of activity. Based on this dust-generation factor and the maximum estimated acreage that could be disturbed at any one time (two acres), a projected total of approximately 7.2 tons of dust would be generated; this estimate is based on a scenario that all dust generating construction and demolition activities would occur within a three month time period.

Increased PM₁₀ emissions resulting from proposed construction activities would comprise short term adverse impacts that could be mitigated through standard dust minimization practices, such as watering exposed soils, soil stockpiling, and soil stabilization. After removal of the soil berms associated with Building 1025 and grading activities are completed, dust emissions would be significantly less. Once the new range is operational and sod has been established in graded, unpaved areas, long term dust emissions from the developed facility would be negligible.

Combustion emissions associated with construction related vehicles and equipment would be minimal because most vehicles would be driven to and kept at the construction site for the duration of demolition and construction activities. As is the case with PM₁₀ emissions associated with demolition and site preparation activities, emissions generated by construction equipment would be temporary and short-term.

Operational Emissions. Implementation of the Proposed Action would result in a new, fully-contained Small Arms Range, with a state-of-the-art ventilation system. The existing range is not a regulated air emissions source at TAFB. Using EPA AP-42 emission factors to calculate the estimated emissions from the type/amount of lead rounds to be fired annually at the new range, the amount of lead emissions is minimal (1 lb/year). Based on the anticipated use of the proposed range, the range would be classified as an insignificant air emission source and would not require permitting action. (See **Table 4-1.**)

No lead rounds are anticipated on the new range when firing rifles or handguns. If a shortage of frangible rounds should occur, lead rounds will be used. Lead rounds will also be used when firing the M240 (7.62 millimeter) and the M249 (5.56 millimeter) machine guns. Since lead rounds will be used, the ventilation system required in the new Small Arms Range must control exposure to lead in accordance with 29 CFR 1910.1025 – *Lead*, in particular, compliance with the permissible exposure limit for airborne heavy metal dust of 50 microgram per cubic meter per hour average for an eight–

hour day. The supply and exhaust air system is critical to the safe operation of a fully enclosed indoor range and to the health of range inhabitants. For an indoor range, the ventilation design must include a positive exhaust system for removing airborne lead. A slight negative air pressure must be maintained, achieved by exhausting 3 to 7 per cent more air than is supplied. Supply and exhaust fan systems must have control interlocks to ensure simultaneous operation. On an enclosed range, all doors into the negative pressure area must have air locks. Re-circulation of range air is not permitted. Clean, hazard free air is essential for a firing range. The Occupational Safety and Health Administration has established the permissible exposure limit for airborne dust at 50 micrograms per cubic per cubic meter per hour average for an eight-hour day (total day exposure may not exceed 400 micrograms). With proper controls and the ventilation system designed for the new range, emissions generated by implementation of the Proposed Action are expected to be below permissible levels.

4.1.2 No-Action Alternative

If the No-Action Alternative were selected, the Small Arms Range would not be constructed. Therefore, conditions would remain as described in Section 3.1; Air Quality and use of the existing facility would continue.

4.2 WATER RESOURCES

Significance criteria for water resources impacts are based on water availability, quality and use; existence of floodplains; and associated regulations. An impact to water resources would be significant if it would:

1. Reduce water availability to or interfere with the supply of existing users.
2. Create or contribute to overdraft of groundwater basins or exceed safe annual yield of water supply sources.
3. Adversely affect water quality or endanger public health by creating or worsening adverse health hazard conditions.
4. Threaten or damage unique hydrologic characteristics, or
5. Violate established laws or regulations that have been adopted to protect or manage water resources of an area including wetlands.

Impacts are significant if such actions are proposed in areas with high probabilities of flooding.

4.2.1 Proposed Action

Surface Water. A small increase in the impermeable surface at the site would occur due to construction of the parking area associated with the new range. However, the new parking area is small compared to the impermeable parking areas in the immediate vicinity, and additional impacts to

the Upper Crutcho Creek drainage area would be minor. Over the long-term, no operations that would affect surface water are anticipated to occur.

The Proposed Action would involve demolition and construction within the footprint of the existing range. The potential for soil erosion exists during demolition of Building 1025 and 1024, resulting in possible adverse impacts on water quality due to increased sediment loading of Upper Crutcho Creek. Prior to commencing the proposed action, TAFB will need to obtain coverage under the Oklahoma General Permit for storm water discharges associated with construction activities. The Permit requires development of a Storm Water Pollution Prevention Plan, which identifies best management practices such as silt fencing, berm construction, etc. to minimize the potential for storm water impacts from construction.

Construction of the new Small Arms Range will include correction of the existing erosion problems, and installation of appropriate engineering controls to ensure that no future erosion occurs. Therefore, the Proposed Action would eliminate the current erosion problems associated with the existing Small Arms Range.

Groundwater. The Proposed Action does not overlie any known groundwater contamination. Contaminated groundwater plumes presently being monitored by TAFB exist to the south and to the west of the site, but do not extend to the area of the Proposed Action, and no monitoring wells are located in the area of the Proposed Action. It is unlikely that groundwater quality would be affected by the construction of the new range, assuming required controls for spill prevention and cleanup are implemented, and since hazardous materials that could affect groundwater quality are not generally associated with the day to day operation of a firing range. Finally, the Proposed Action site does not overlie an identified groundwater recharge zone of special significance and the footprint of facility development is negligible with regard to groundwater area below the region. Therefore, the Proposed Action would not have an adverse impact on groundwater resources.

Wetlands. Maps from the TAFB INRMP were obtained for wetlands locations, and no wetlands identified are located on or near the Proposed Action site. However, NWI wetlands are located approximately 600 feet south of the Proposed Action site along East Crutcho Creek. Implementation of proper erosion control measures during construction will ensure that these NWI wetlands are not negatively impacted. Therefore, the Proposed Action would not have an adverse effect on any wetlands located on TAFB.

Floodplains. Maps from the INRMP were also obtained that designated the 100-year and 500-year floodplains on TAFB. According to those maps, the Proposed Action site does not fall within the floodplains; therefore, the Proposed Action would not have any effect on the TAFB floodplains.

4.2.2 No-Action Alternative

If the No-Action Alternative were selected, proposed construction activities would not be implemented and water resource conditions would remain unchanged from their current status. Selection of the No-Action Alternative would not impact regional or local water resources.

4.3 HAZARDOUS MATERIALS AND HAZARDOUS WASTE

4.3.1 Proposed Action

4.3.1.1 Hazardous Materials

The use of hazardous materials during the implementation of the Proposed Action is expected to be limited to construction vehicle maintenance (fuel, oils, and lubricants) and construction activities which use adhesives, sealants, paints, etc. These materials would be properly stored and contained during the demolition and construction activities.

4.3.1.2 Hazardous Waste

Small Arms Ranges for weapons training are essential to the mission of many USAF facilities. However, their use often produces lead-contaminated soil. Before demolition of the existing range occurs, random soil sampling will need to be performed to assess the extent of lead contamination, and properly characterize the soil for hazardous constituents per applicable state and federal regulations. Under RCRA, materials containing lead concentrations of 5 mg/l or greater by the TCLP metals method are classified as characteristic hazardous waste. Therefore, soil with lead levels of 5 mg/l or greater would be considered an EPA hazardous waste, and would have to be disposed of offsite at an EPA-permitted hazardous waste landfill. A Work Plan and a Sampling/Analysis Plan would be generated detailing the aspects of the remediation. Lead-contaminated soil around the bullet trap of Building 1024 was remediated in 1995. Additional random sampling will need to be performed before Building 1024 is demolished. Building 1025 contains a large sand trap, which still contains many rounds from past training. No frangible rounds were ever fired at Building 1025. Building 1025 is no longer in operation, and before demolition, the sand trap will have to be removed, with the lead rounds being reclaimed for recycling, and the remaining sand sampled for hazardous characteristics. Additional random sampling will need to be conducted around Building 1025 before the concrete structures are demolished and the large earthen berms are removed. To properly characterize the site, a Phase Two Environmental Site Assessment would need to be performed before demolition activities. The long term impact resulting from this portion of the Proposed Action would be positive, resulting in the removal of lead-contaminated soil, if such contamination is found.

The existing range (Building 1024) contains a filtered ventilation system and bullet traps. The filters and the bullet traps are changed out and cleaned after approximately 100,000 rounds are fired in the range or, at a minimum, every six months. The filters and removed particles from the frangible rounds are disposed of as lead-contaminated waste. At this time, if the new range is built, it is anticipated that the filter and bullet trap will be maintained in a similar fashion to the existing range.

Building 1023 is the weapons maintenance and cleaning area of the range. Building 1023 contains an enclosed weapons cleaning tank that holds 50 gallons of *EcoLink New II*, a new generation solvent that is an environmentally preferred parts cleaner and is an aliphatic petroleum distillate. The solvent is changed approximately every two years.

Hazardous materials used and hazardous waste generated by the Proposed Action would be similar to the existing range, creating no negative impact from this project.

4.3.1.3 Toxic Materials

NESHAP regulates all asbestos removal and demolition, enforced by the DEQ. Before demolition of any structure, an asbestos inspection must be performed by an asbestos professional licensed by the DEQ. The DEQ also requires that a NESHAP notification be submitted to the DEQ a minimum of 10 working days before demolition activities commence.

Construction debris and any excavated soils will be sampled and analyzed to determine the lead concentration. If determined to be non-hazardous, these materials can be disposed of at local landfills licensed by DEQ. Conversely, if determined to be hazardous, these materials will be disposed at an appropriately-permitted hazardous waste facility.

4.3.2 No-Action Alternative

If the No-Action Alternative is selected, TAFB would not implement the Proposed Action. Therefore, no impacts with regard to hazardous materials and hazardous waste would occur, and conditions would remain the same.

4.4 BIOLOGICAL RESOURCES

4.4.1 Proposed Action

The Proposed Action site for the Small Arms Range contains existing structures, but the site is composed mainly of mowed open areas and fence lines. Vegetation on the site is limited in diversity, consisting primarily of turf or lawn type grasses. Due to the lack of native vegetation species, implementation of the proposed action would not significantly affect the vegetation communities on the proposed site.

Owls have been using the old easternmost range (Building 1025) for roosting and, therefore, would experience term impacts during demolition and construction activities. Threatened, endangered, and sensitive species are described in Section 3.4 of this EA. Several of the faunal species could also inhabit the wooded area along Upper Crutcho Creek south of the proposed site, but would not be impacted by the Proposed Action.

4.4.2 No-Action Alternative

If the No-Action Alternative is selected, TAFB would not implement the Proposed Action. Therefore, no impacts to biological resources would result.

4.5 CULTURAL RESOURCES

4.5.1 Proposed Action

The cultural resources of TAFB relative to construction of the proposed Small Arms Range are discussed in Section 3.5 of this EA.

No archeological sites are known to occur on or near the Proposed Action site. The area is classified as developed land, and was previously impacted by the construction of the existing range. No buildings are present on the site that would be eligible for inclusion on the National Register of Historic Places. The Historic District and other historic resources are located across the airfield from the Proposed Action site. Therefore, implementation of the proposed action would not have any impact on cultural resources on TAFB.

4.5.2 No-Action Alternative

If the No-Action Alternative is selected, no impacts with regard to cultural resources would result.

4.6 NOISE

4.6.1 Proposed Action

The proposed site for the Small Arms Range is south/southwest of the active airfield. The noise levels from construction will be temporary and will not affect any sensitive receptors. The Small Arms Range to be built in the proposed action is in accordance with *Engineering Technical Letter (ETL) 08-11*. The fully-contained range will muffle noise from the firearm training and send much less unwanted noise into the surrounding area. However, by being fully-contained, those who work or train at the new range will be exposed to higher noise levels and will be expected to wear the proper hearing protection required for fully-contained ranges.

4.6.2 No-Action Alternative

If the No-Action Alternative is selected, TAFB would not implement the Proposed Action and impacts with regard to noise would not change.

5.0 CUMULATIVE IMPACTS

Cumulative impacts on environmental resources result from incremental impacts of the Proposed Action when combined with other past, present, and reasonably foreseeable future projects in an affected area. Cumulative impacts can result from minor but collectively substantial actions undertaken over a period of time by various agencies (Federal, state, or local) or persons. In accordance with NEPA, the cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the near future are discussed below.

Projects in addition to the Proposed Action are planned in the vicinity of the Eastside Depot Maintenance District of TAFB. These projects include:

- Demolition of TAFB facilities due to the acquisition of TAC (FY 2010-2018) Approximately 1.2 million square feet of TAFB facilities will be vacated due to processes being relocated to TAC. The timeline for demolition of specific facilities will be determined at a later date.
- Construction of Phase III, 3rd Combat Communication Complex (FY-11) A new Squadron Operations Complex will be designed and constructed for the 32nd Combat Communications Squadron at TAFB. The new facility would replace 13 substandard existing facilities. The new consolidated facility would enhance the squadron's capability to train, maintain its equipment, and to deploy to any location in the world. The site for this complex is east of Air Depot and north of Reserve Road.
- Consolidated Security Forces, South Forty Development (FY-11) A new facility will be constructed to relocate and consolidate key Security Police Operations at a single facility. This 64,000 square foot facility will be built on the south side of TAFB.

The projects listed above are planned for construction during roughly the same timeframe as implementation of the Proposed Action would occur. Consequently, the potential exists for cumulative environmental impacts to occur with regard to air quality, noise, socioeconomics, and traffic. Cumulative air quality and noise impacts are expected to be less than significant since all projects would be required to implement best management practices to reduce air and noise emissions below significance thresholds and comply with local noise regulations.

The projects on TAFB will have short term impacts to traffic caused by additional construction equipment and construction workers traveling along surrounding roadways and could potentially cause a short term adverse cumulative impact during peak traffic hours. However, construction will be short term and additional traffic on base will be minor and not disrupt normal traffic flows. Therefore, cumulative impacts to transportation and circulation are expected to be less than significant.

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8.0 LIST OF PREPARERS

Name/Organization	Degree	Resource Area	Years of Experience
Diane Abernathy, The Benham Companies, LLC	B.S., Chemical Engineering M.S., Industrial Hygiene	Program Manager, Multiple Areas	24
Cheryl Cohenour, Cherokee CRC	B.S. Biology B.S. Chemistry	Project Manager, Multiple Areas	25
John Sparkman, Cherokee CRC	B.S. Biology M.S. Industrial Mgmt	NEPA Compliance Water Resource Planning Threatened/Endangered Species	15
Dwayne Beavers, Cherokee CRC	M. S. Geology	Groundwater/Soil Classification	20
George Wooden, Cherokee CRC	N/A	Research/Technical Review	30

Table 2-1: Anticipated Environmental Effects of Proposed Action

Resource	Anticipated Environmental Effects
Air Quality	<p>Short term adverse impacts from dust emissions from construction are anticipated.</p> <p>Short term adverse impacts from combustion emissions from construction equipment are considered to be negligible.</p> <p>Operational emissions are anticipated to be negligible due to incorporation of state-of-the-art ventilation system design and air pollution controls.</p>
Surface Water	<p>Potential for short term soil erosion and storm water impacts from construction activities.</p>
Construction Debris and Excavated Soils	<p>Soils at the site may be contaminated from historic use of lead rounds and may meet the definition of hazardous waste.</p> <p>Sand trap to be removed contains lead rounds and lead-contaminated sand.</p>
Asbestos-Containing Material (ACM)	<p>Structures to be demolished may contain ACM.</p>
Lead Based Paint	<p>Construction debris may contain lead based paint.</p>
Noise	<p>Temporary noise impacts associated with construction are considered to be negligible.</p> <p>Exterior noise impacts during operations are considered to be negligible, due to planned construction of a fully-contained range.</p> <p>Interior noise impacts are anticipated, due to planned construction of a fully-contained range.</p>

Table 2-2: Summary of Mitigation for Insignificant Adverse Environmental Impacts

Resource	Mitigation and Best Management Practices
Air Quality	<p>Dust emissions from construction will be minimized through such practices as watering exposed soils, soil stockpiling, and soil stabilization.</p> <p>Dust emissions from operations will be minimized through long term stabilization of the site, such as use of pavement and sod.</p>
Surface Water	<p>Short term storm water impacts and erosion will be minimized through compliance with the Oklahoma General Permit for storm water discharges associated with construction activities, and best management practices such as silt fencing and temporary berm construction.</p>
Construction Debris and Excavated Soils	<p>These materials will be characterized and, if determined to be hazardous waste, removed and managed at an EPA-approved landfill. If non-hazardous, the materials can be disposed at an approved Subtitle D landfill.</p> <p>Lead rounds from the old Building 1025 sand trap will be removed and recycled. The sand will be characterized and, if determined to be hazardous waste, removed and managed at an EPA-approved landfill. If non-hazardous, the materials can be disposed at an approved Subtitle D landfill.</p>
Asbestos-Containing Material (ACM)	<p>Prior to demolition, all structures will be inspected for the presence of ACM by a licensed professional. Notice of demolition will be made to DEQ.</p>
Lead Based Paint	<p>Any demolition debris containing lead based paint may be disposed of as solid waste at a local landfill.</p>
Noise	<p>Interior noise from operations of a fully-contained range will be mitigated through operating procedures that require proper hearing protection.</p>




Table 4-1: Annual Emission Estimates from Proposed Small Arms Range

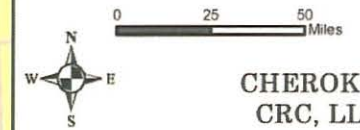
M240 (7.62-MM Ball Cartridge) Draft AP-42 02/08, p 15.1-77-81, Tables 15.1.15-1 and 15.1.15-2						
			Emission Factor		Emissions	**Emissions
	CAS	Pollutant	(lb per item)	Number of Rounds/yr	(lb/yr)	(lb/yr)
	124-38-9	CO2	0.0012	52000	62.4	124.8
	630-08-0	CO	0.0023	52000	119.6	239.2
	7439-92-1	*Lead (Pb)	0.0000049	52000	0.2548	0.5096
	74-82-8	Methane	0.00001	52000	0.52	1.04
		NOx	0.000097	52000	5.044	10.088
		PM - 2.5	0.000038	52000	1.976	3.952
		PM -10	0.000051	52000	2.652	5.304
	12789-66-1	TSP	0.000051	52000	2.652	5.304
	7664-41-7	*Ammonia	0.000033	52000	1.716	3.432
	74-90-8	*Hydrogen cyanide	0.0000045	52000	0.234	0.468
		* These are the three HAPs with the highest emission factor for this ordnance.				
		** Emissions if rounds were doubled (104,000 rounds).				
M249 (5.56-MM Ball Cartridge) Draft AP-42 02/08, p 15.1-77-81, Tables 15.1.15-1 and 15.1.15-2						
			Emission Factor		Emissions	**Emissions
	CAS	Pollutant	(lb per item)	Number of Rounds/yr	(lb/yr)	(lb/yr)
	124-38-9	CO2	0.00087	44000	38.28	76.56
	630-08-0	CO	0.0016	44000	70.4	140.8
	7439-92-1	*Lead (Pb)	0.0000051	44000	0.2244	0.4488
	74-82-8	Methane	0.0000097	44000	0.4268	0.8536
		NOx	0.000085	44000	3.74	7.48
		PM - 2.5	0.000028	44000	1.232	2.464
		PM -10	0.000039	44000	1.716	3.432
	12789-66-1	TSP	0.000038	44000	1.672	3.344
	7664-41-7	*Ammonia	0.00003	44000	1.32	2.64
	74-90-8	*Hydrogen cyanide	0.000022	44000	0.968	1.936
		* These are the three HAPs with the highest emission factor for this ordnance.				
		** Emissions if rounds were doubled (88,000).				
Above estimates based on information provided by Danny W. Cross, Chief, Combat Arms via email dated November 10, 2008.						

OKLAHOMA

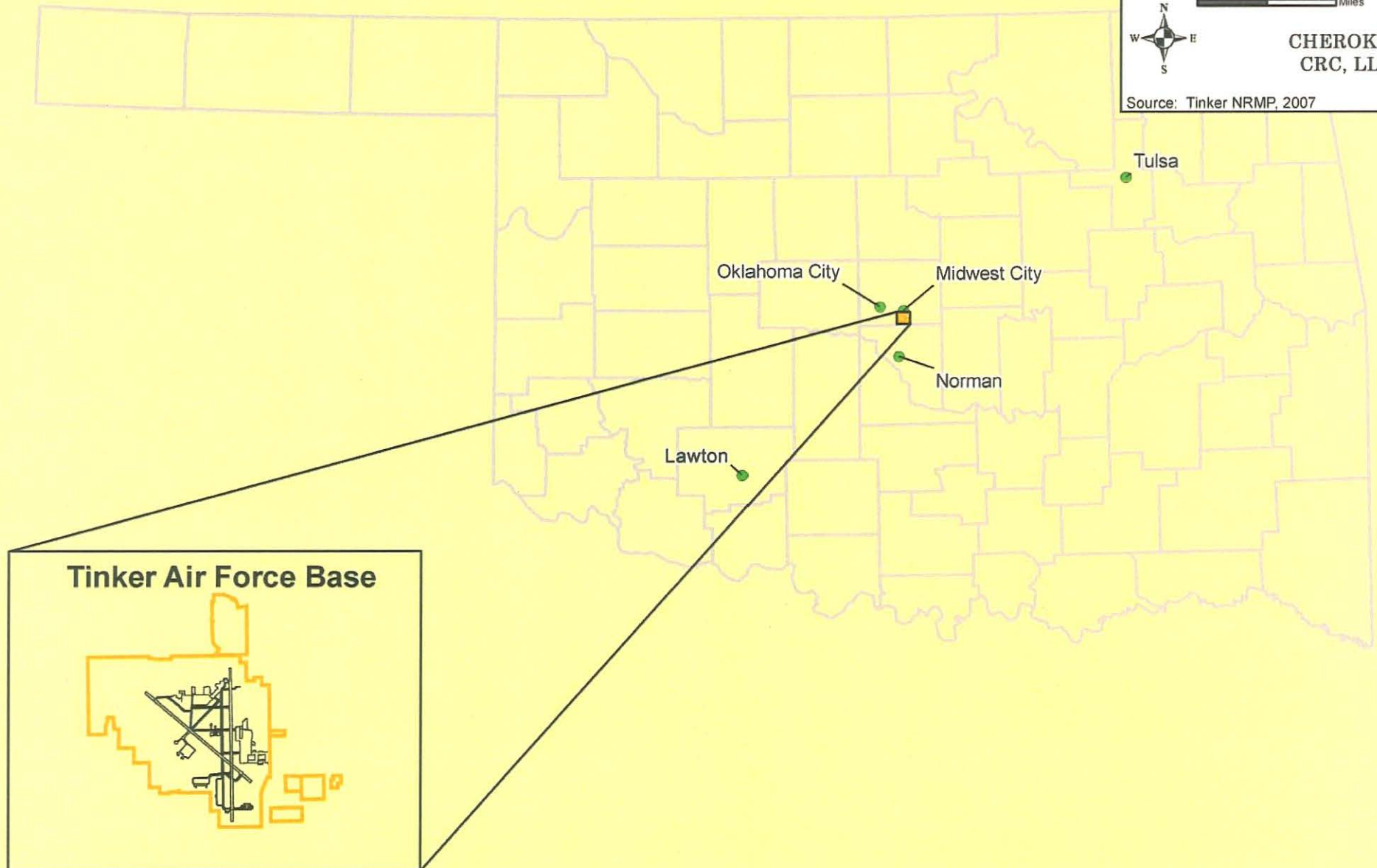
**Figure 1-1
TAFB Site Location**

Legend

-  Tinker AFB
-  Cities
-  State/County Boundaries



Source: Tinker NRMP, 2007



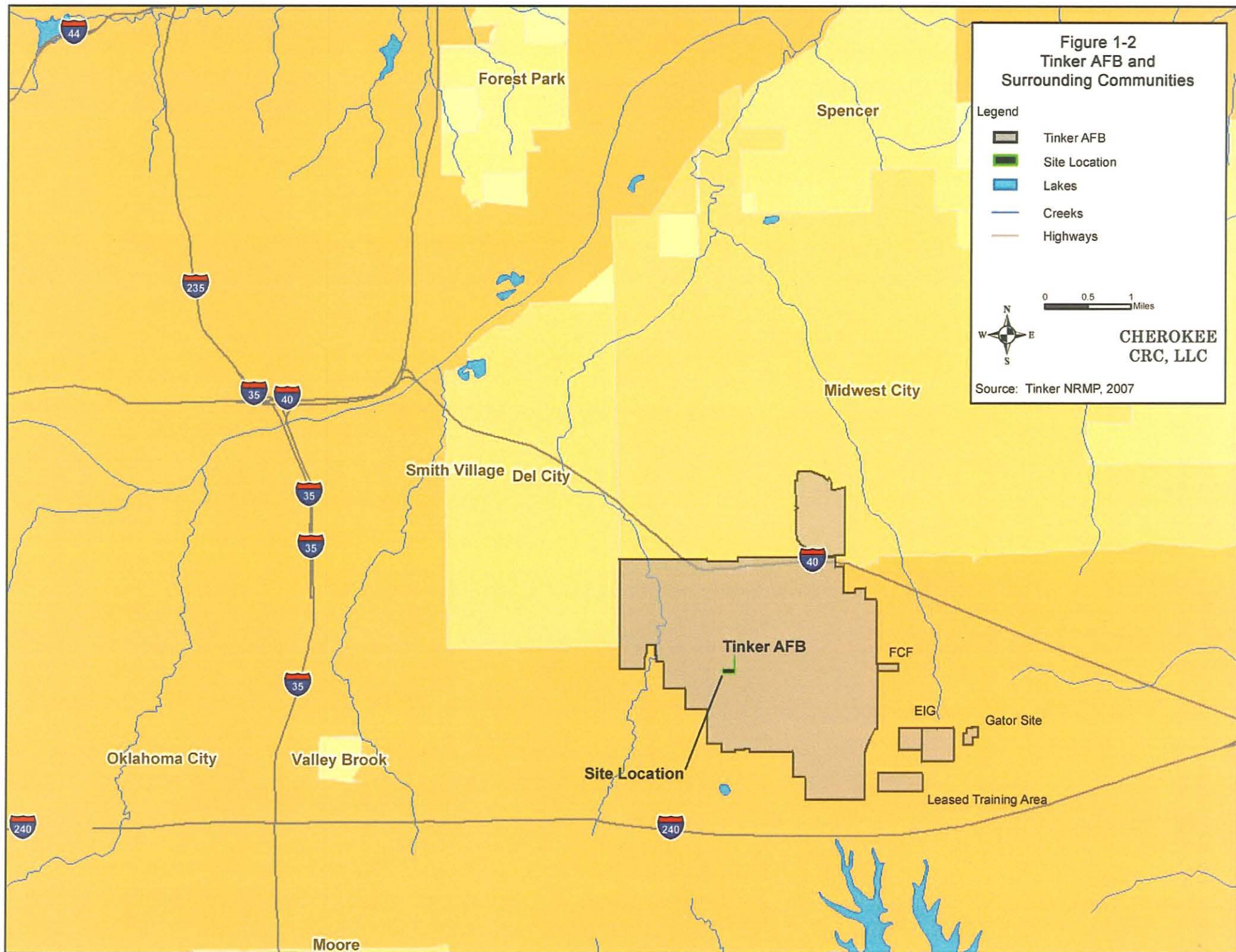
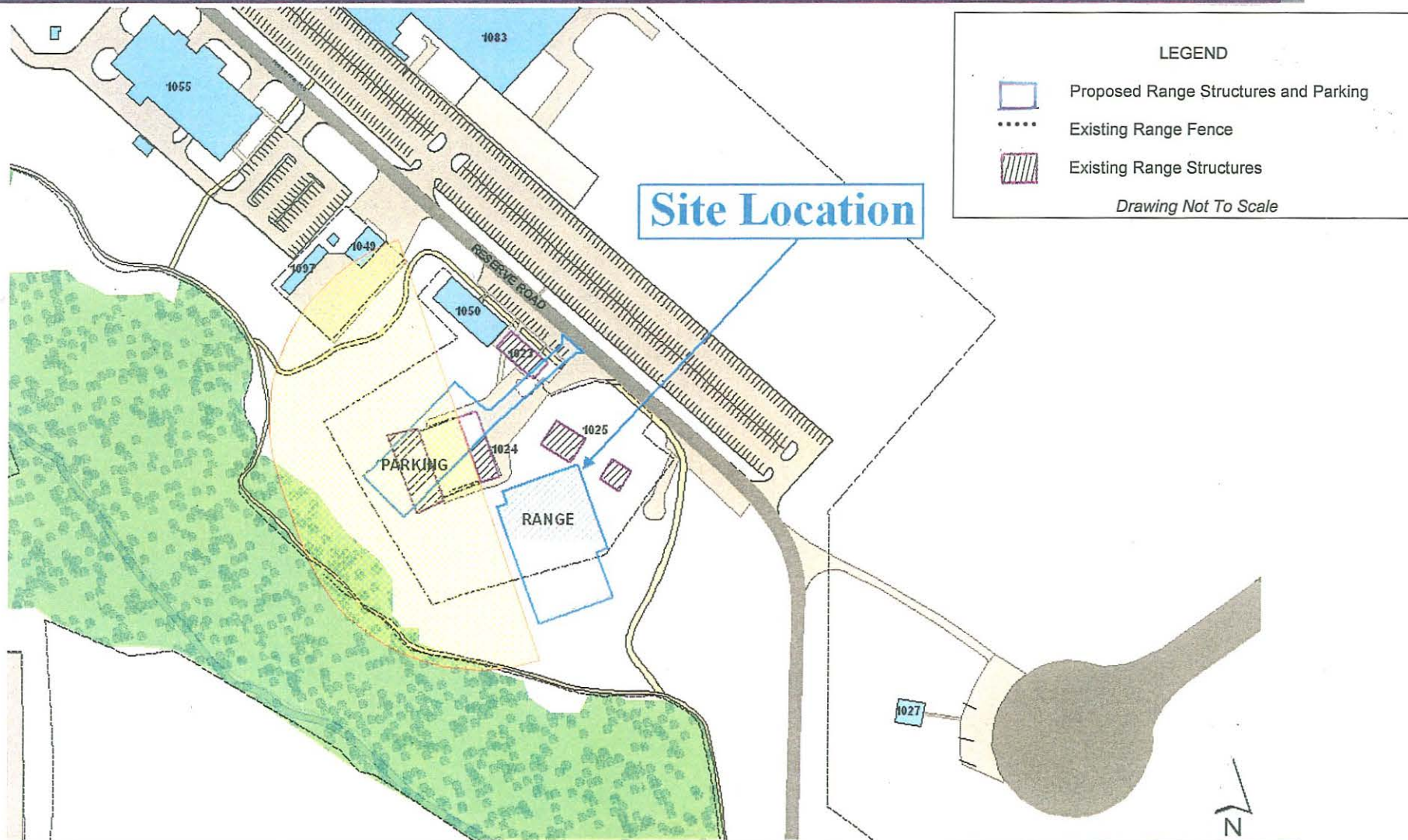




Figure 2-1
Small Arms Range Site Location



Small-Arms Range



Agile Base and Worldwide Support

Figure 2-2
Aerial Photo of Existing Site

0 100 200
Feet



CHEROKEE
CRC, LLC

Source: USDA-NAIP 2008 Digital Orthophotography

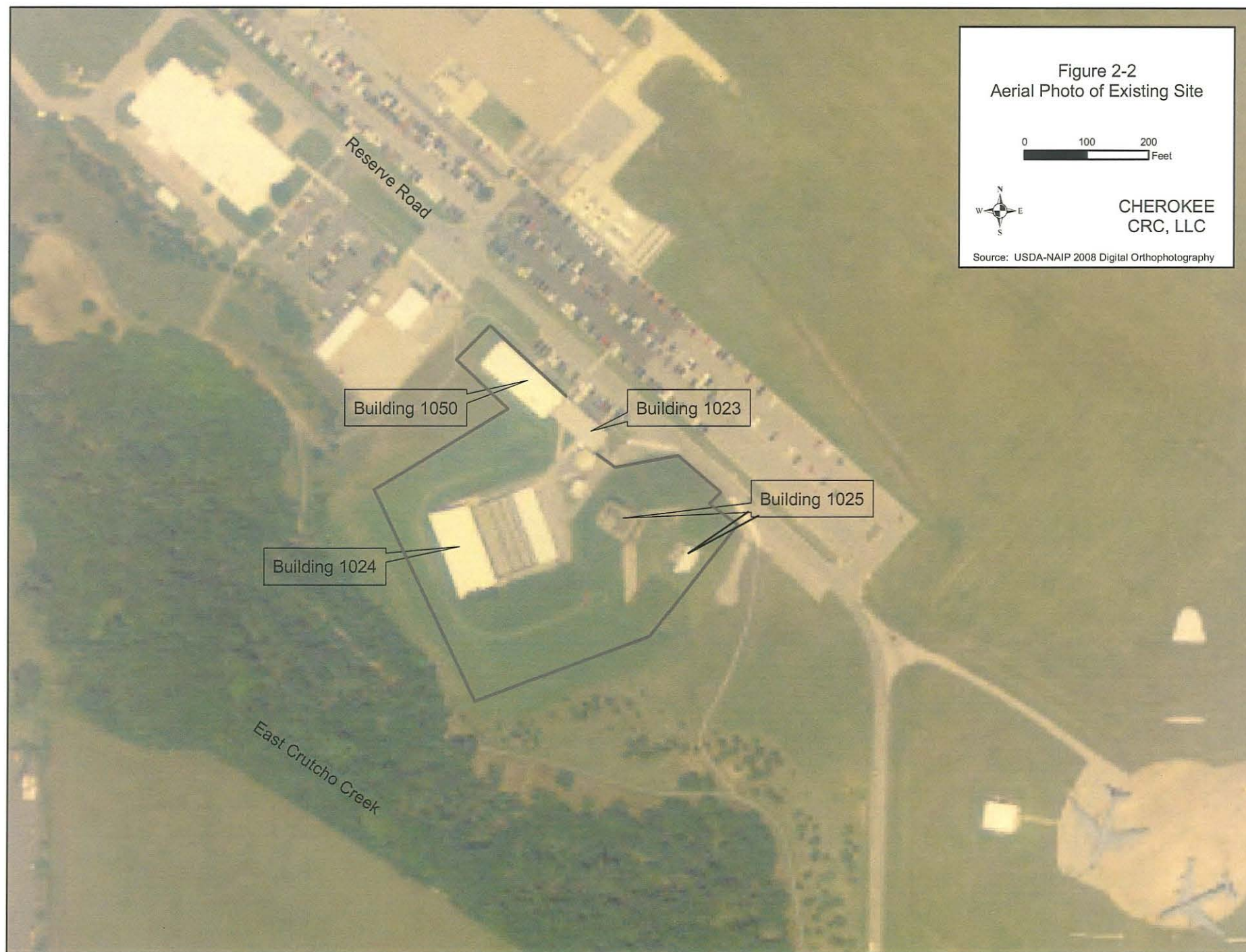


Figure 3-1

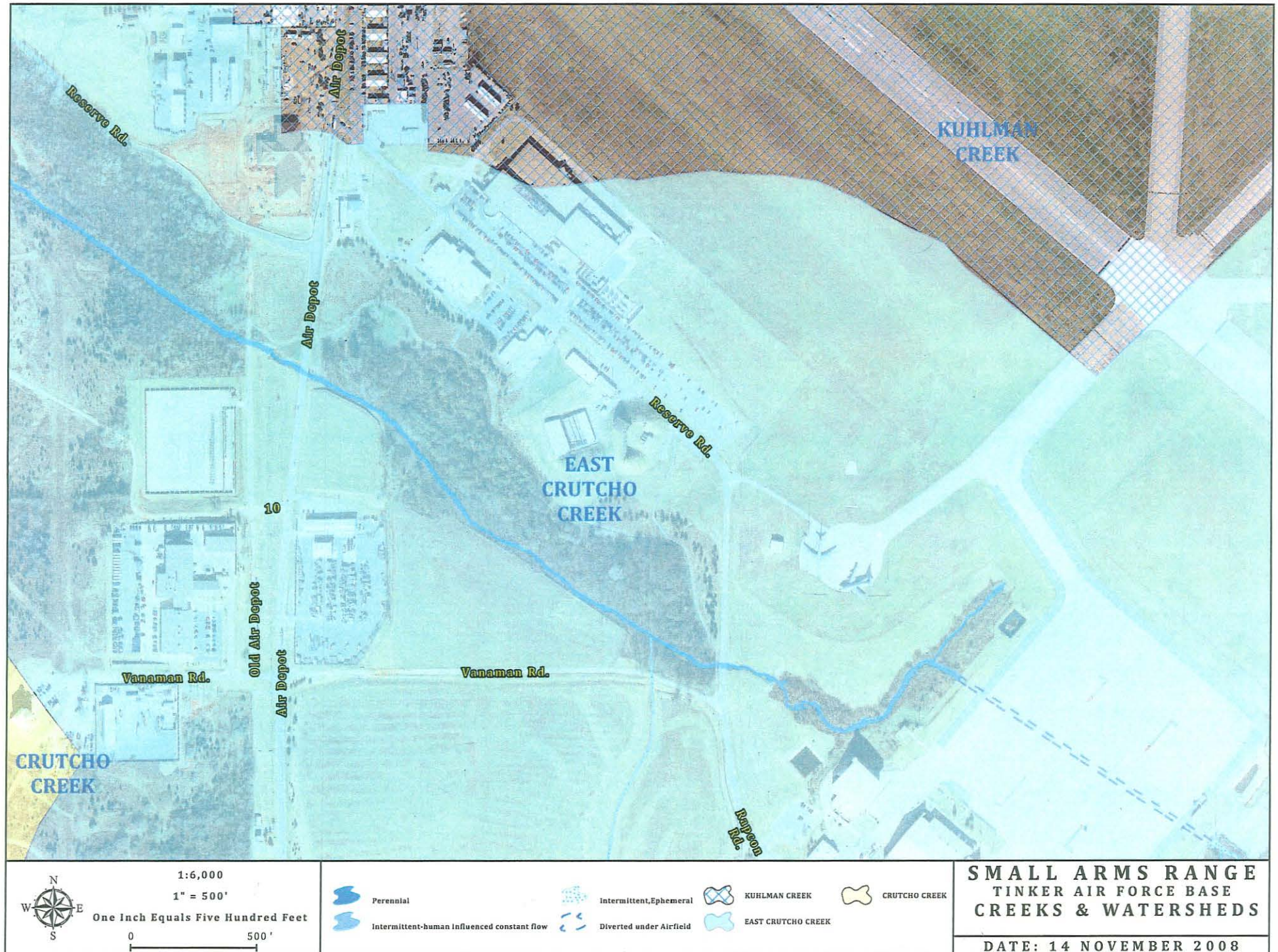


Figure 3-2

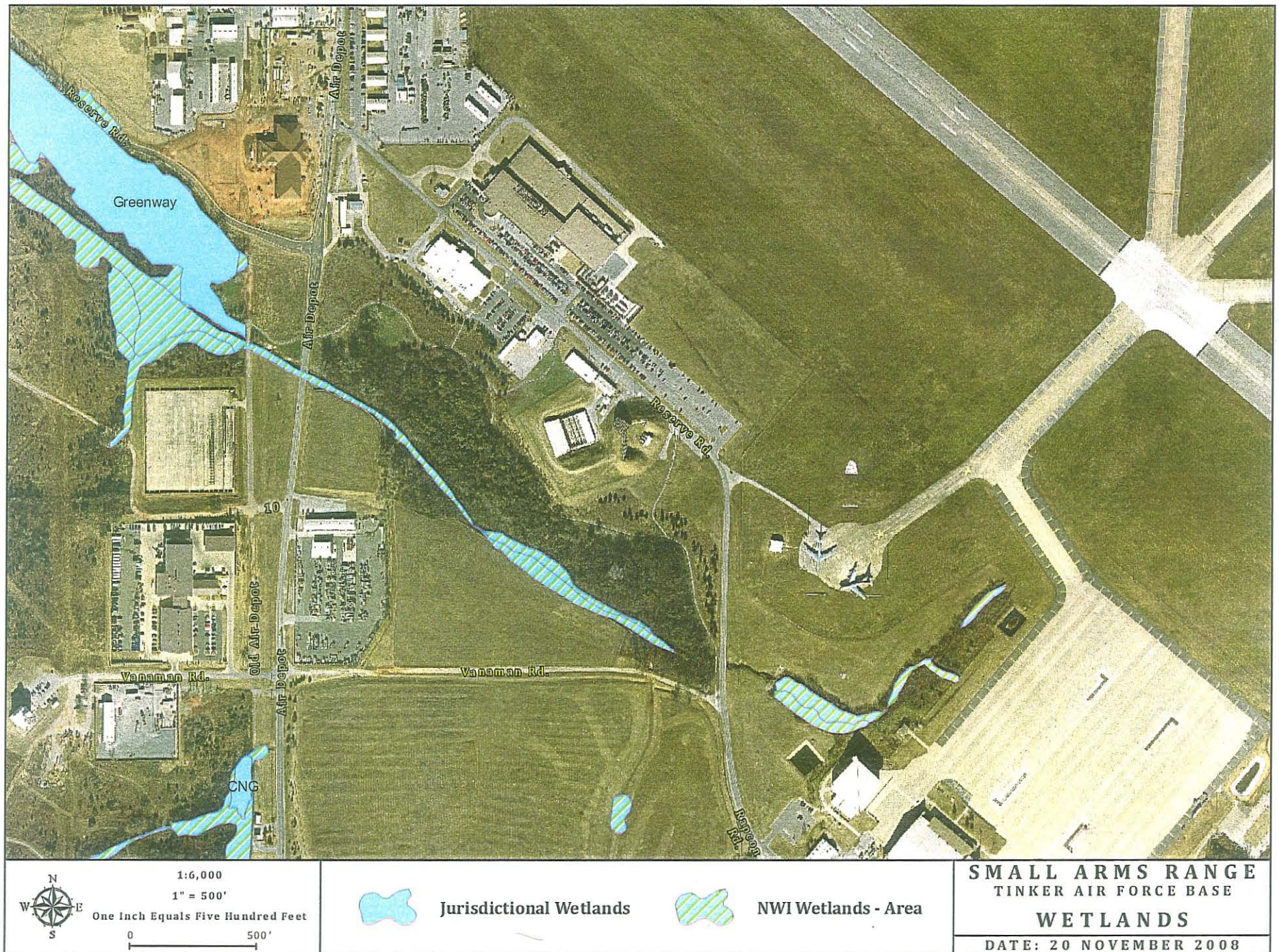


Figure 3-3

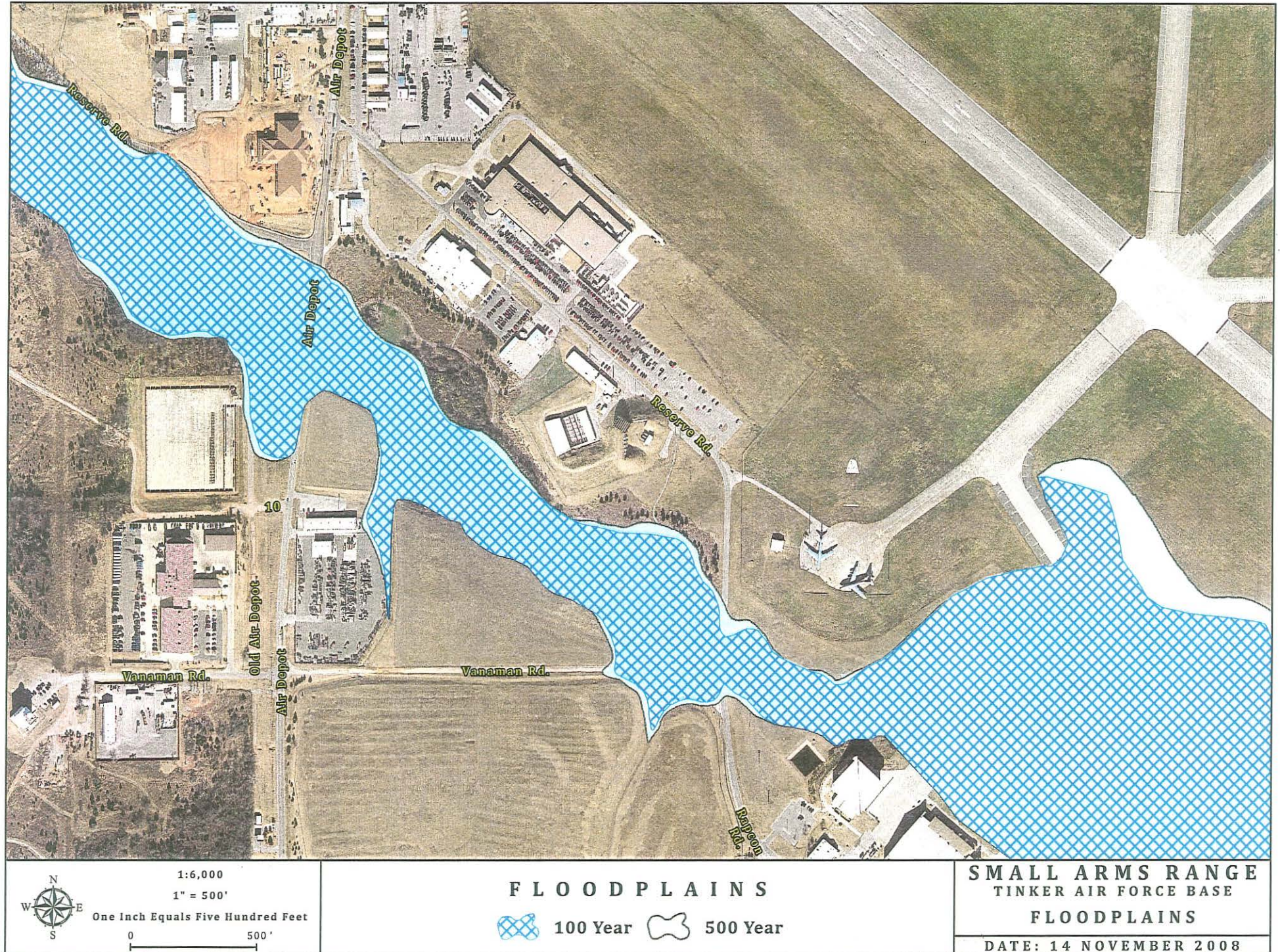


Figure 3-4

